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Supreme Court, U. S.

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**Supreme Court of the United States**  
CLERK

OCTOBER TERM, 1995

LOTUS DEVELOPMENT CORPORATION,

*Petitioner,*

—v.—

BORLAND INTERNATIONAL, INC.,

*Respondent.*

ON WRIT OF CERTIORARI TO THE UNITED STATES  
COURT OF APPEALS FOR THE FIRST CIRCUIT

**JOINT APPENDIX  
VOLUME II OF II  
(Pages J.A. 540 to J.A. 985)**

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IN THE UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS

Civil Action No. 90-11662-K

VOLUME 1

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LOTUS DEVELOPMENT CORPORATION,

*Plaintiff,*

—against—

BORLAND INTERNATIONAL, INC.

*Defendant.*

---

DEPOSITION UPON ORAL  
EXAMINATION  
OF  
ADAM BOSWORTH

---

CONTAINS SPECIALLY CONFIDENTIAL MATERIAL  
ATTORNEY EYES ONLY

10:02 a.m.

April 29, 1991

5400 Columbia Center

Seattle, Washington

Mary A. Hall, CSR  
Court Reporter

[4] BY MR. KONRAD:

Q. Would you please state your full name and address for the record.

A. Adam Bosworth. My address is 9324 Southeast 57th Street, Mercer Island, Washington 98040.

\* \* \*

[5] Q. Thank you. By whom are you employed, sir?

A. Microsoft.

Q. For how long have you worked for Microsoft?

A. I joined Microsoft October 1st, 1989, so since then.

\* \* \*

[12] Q. When did you stop working as an employee formally for Borland?

A. Approximately June of 1989.

Q. When did you start working for Borland?

A. Approximately October of 1985.

\* \* \*

[43] Q. What was your first position with Borland?

A. My first position was to manage the development of a new spreadsheet product.

Q. Was that the product that became Quattro?

A. Yes.

\* \* \*

[53] Q. For how long at Borland was it your responsibility to be the manager for the development of the spreadsheet product that became Quattro?

A. Until approximately May of 1988.

Q. By which point Quattro 1.0 was being sold, correct?

A. Yes.

\* \* \*

[58] Q. Do you have any sense as to what proportion of your time you spent between October '85 and May '88 on the project that became Quattro?



A. Yes.

Q. How much?

A. Ninety-nine.

Q. As best you can recall, when did Quattro first get published?

A. Published?

Q. Sold, released.

A. December of 1987.

Q. Prior to that point within Borland itself, excluding the Hungarian fellows, who else was working on Quattro?

A. In what capacity?

Q. In a development capacity, let's focus on.

A. What do you mean by development?

Q. Let's say developers other than quality assurance people.

A. Okay. Inga Mortenson.

Q. Inga Mortenson.

A. David Chach. I believe it's C H A C H; [59] Charles Batterman, B A T T E R M A N; Peter Iaria, I A R I A; Tanj Bennet, T A N J, B E N N E T; myself, Adam Bosworth; Roger Schafly, S C H A F L Y. In a development capacity?

Q. Yes.

A. I believe that's all other than the Hungarians.

Q. And to be clear, I meant to exclude quality assurance people.

A. Yes, I excluded. These are only people that worked on code other than quality assurance.

Q. I appreciate that. With respect to this project before the time Quattro was released, did you have someone to whom you reported?

A. Yes.

Q. Who was that?

A. It changed.

Q. Initially to whom did you report?

A. Philippe, Philippe Kahn.

Q. And he was the chief executive of Borland?

A. Yes.

Q. Did there come a time when you reported to someone else?

A. Yes.

\* \* \*

[64] Q. Among the people that you have identified who worked on the development of Quattro before it was released, is there one or more whom you would identify as the designer of its user interface?

A. Yes.

Q. Who is that?

A. Me.

Q. When we're using the term user interface there, how do you understand that term?

A. The totality of the ways in which the user can interact with the program, including the display, keys, the sequence of commands, the use of function keys, the navigation path to execute a process and the functionality that is displayed to the user.

\* \* \*

[71] Q. To your recollection, who developed the 123.RSC file?

A. To my recollection, final responsibility on [72] that lay with Joanne Lin.

\* \* \*

[74] Q. Did there come a time when it was decided that Quattro should have the ability to read and execute macros written originally in 1-2-3?

A. Yes.

Q. To the best of your recollection, when?

A. Between October and December 1987—No. Sorry. 1985, October, November 1985.

Q. During the first few months that you were there?

A. Yes.

Q. Who made that decision?

A. I did.

Q. Did Philippe Kahn approve that decision?

A. No. Excuse me. What do you mean by approve?

Q. Was there a moment when you went to Philippe Kahn who was your superior at the time and said I think we ought to do this, do you approve, and he said yes?

A. No.

\* \* \*

[82] Q. Did there come a time in the development of Quattro when it was decided that the product should provide macro compatibility with 1-2-3?

A. Yes.

Q. When was that?

A. I don't know exactly.

Q. Do you recall approximately when?

A. I can only tell you by which time I know we had decided. There was no concrete point we said yes, we must be compatible.

Q. I understand. As best you can.

A. June 1986.

\* \* \*

[83] Q. Who had made the decision that Quattro should have macro compatibility?

A. Me.

\* \* \*

[88] Q. Did you consider it necessary in order to sell Quattro that you provide the macro compatibility with 1-2-3?

[89] A. At that point I was not sure.

Q. Did there come a time when you determined in your own thinking that it was necessary to provide macro compatibility with 1-2-3 in order to have market success with Quattro?

A. No.

Q. Have you ever reached that conclusion?

A. No. It could excel.

Q. I don't want to flog the subject—this could well be my last question on it—but the time you made that decision to have some macro compatibility, did you believe that providing that would at least enhance the market appeal of Quattro?

A. At which time?

Q. Prior to the time in June '86 when the gentlemen came over.

A. No.

Q. Did you conclude that at some later point?

A. Yes.

Q. Can you recall particularly when?

A. Not particularly.

Q. Was there anything further that you learned or studied or analyzed that helped you reach that conclusion?

A. Yes.

[90] Q. What was that?

A. Talking to expert spreadsheet users.

Q. Are there any in particular that you're thinking of?

A. The Cobb Group.

Q. Where were they located?

A. In Lexington, Kentucky, I believe.

Q. Among other things, Mr. Cobb wrote a very famous and successful book about 1-2-3?

A. Yes.

Q. That's the same fellow?

A. Well, it wasn't the same fellow I was talking to but he's part of that group.

Q. Fair enough. Do you recall with whom you spoke there?

A. I spoke briefly to his brother, I believe, and I spoke to Ted Cunningham or Tom Cunningham, the director of sales for that group.

Q. Do you recall what they told you about providing macro compatibility?

A. Not in the exact words.

Q. Generally. I understand.

A. Generally they felt it was important to be able to run all of 1-2-3 macros.



Q. Do you recall approximately when you had [91] that discussion?

A. No. There was numerous discussions.

Q. But this was after the discussion we were talking about before?

A. I believe so.

\* \* \*

Q. Well, for what reason did the Cobb Group believe it was important to run all 1-2-3 Macros?

A. To enhance market success. That's different than achieving it.

Q. Fair enough.

Was there anyone else that you can recall specifically discussing that subject with?

A. There was a product 1-2-3 macro that was used for teaching 1-2-3 macro, teaching 1-2-3. I don't recall the name but I worked with the authors. And they also felt strongly that 100 percent [92] compatibility was important with the 1-2-3 Macros. And I don't recall their names but there were various beta sites who felt similarly.

Q. I'm just going to try some names. Was the macro product 101 Macros?

A. Yes. Thank you.

Q. When you say beta sites, beta is usually a term for testing outside a company after a product is well in development and coming up towards release, isn't it?

A. That's correct.

Q. As Quattro initially went into beta testing, did it not provide 100 percent macro compatibility?

A. No, it did not.

Q. Do you recall approximately when Quattro went into beta?

A. No.

Q. Can you peg it backwards from the time of release in November, December '87?

A. Only very approximately.

Q. Just so we can continue to talk, do you have any sense?

A. As approximately as—as precisely as I can remember, it was in the late spring or early [93] summer of '87. But I want to emphasize I'm not at all confident on those dates.

Q. Precision on that date is not my point here.

What kind of macro compatibility, if any, did the product have at that point?

A. With other products than itself?

Q. Specifically 1-2-3.

A. Limited.

\* \* \*

[96] Q. You mentioned Joanne Lin. Do you recall anyone else who worked on the 123.RSC file from the time that the product went into beta until it was commercially released?

A. What do you mean by worked on?

Q. Developed.

A. What do you mean by developed? Do you understand what it takes to develop it?

Q. What do you mean by develop?

MR. GREGORIAN: Wait a minute. If he doesn't understand your question, you have an obligation to put to him a question that he does understand.

MR. KONRAD: I would like to do so by using terms that he's comfortable with.

MR. GREGORIAN: Develop is contextual.

A. By develop, I normally mean that you wrote code.

Q. Did new code have to be written from the time of the beta test on?

A. For what purpose?

Q. To implement the 1-2-3.RSC file.

A. Yes, but it's not part of the 123.RSC file.

Q. Is there a name for the file in which the new code was written?

[97] A. Yes.

Q. What's that?

A. Quattro.EXE.

Q. As the product went into beta testing as you recall, could the user cause the program to display 1-2-3 command readings?

A. I just don't remember exactly. I don't think so but I don't remember.

Q. As released, the product does allow the user to display 1-2-3 command menus, doesn't it?

A. It allows the user to display a command, allows the user to pick a menu which has words in common with the 1-2-3 menu.

Q. In Quattro, what file causes those words in common to appear?

A. 1/2/3.RSC.

Q. Are there any subdivisions within that file?

A. Any subdivisions?

Q. Are there separately identified components of the 123.RSC file?

A. Yes.

Q. Is there a separate component of it that causes menu display?

A. There is a component of the RSC file that [98] describes the menus to be displayed, yes.

Q. And that component contains within it the words that appear in the menu, right?

A. Yes, it does.

Q. Do you know who wrote that file?

A. The file is built by programming. The person doesn't write the file. They interact with the program to build it. I don't know if I'm making myself clear but—it's like asking who wrote a WK1 file.

Q. Was it written using the menu builder?

A. Yes.

Q. Do you know who created that file using the menu builder?

A. Someone working for JoAnne Lin. Whether it was her directly or someone reporting to her, I don't know.

Q. Do you recall any names of the people who worked for her at that time?

A. Uh-huh.

Q. Who?

A. Asha Nelson; someone called Cheryl, and I don't recall Cheryl's last name. No, I would recall more names if I were given them but I don't recall them.

[99] Q. To your understanding, did someone have to write a new file or using the menu builder create a new file that contained the menu commands from 1-2-3 in order to complete the 123.RSC file as it finally shipped?

A. Yes.

Q. Do you have any understanding as to whether the 1-2-3 software was used in that process?

A. No. I don't believe it was. I don't have a good understanding of that.

Q. Do you have any understanding as to whether documentation from 1-2-3 was used in that process?

A. I don't believe it was.

Q. Do you have any reason for not believing that it was?

A. Yes.

Q. What's that?

A. There was a book that was widely used by people in Quattro using 1-2-3 that was usually used by people worrying about these issues and I believe they used that book. Excuse me. It was either using 1-2-3 or tips and Techniques on—I don't remember the exact name of the book but there was a book that was widely regarded as being sort of the definitive statement of this.

[100] Q. Definitive statement of what?

A. Of what the 1-2-3 command sequence would be.

Q. After Quattro went into beta testing, you received information from beta testers, perhaps others, about having 100 percent macro compatibility, I think you described it. Was there some decision made at Borland to change the product and provide that?



A. We didn't have to change the product. There was a decision made to include the 123.RSC but virtually no lines of code had to be changed.

Q. Was the decision made to include the 123.RSC file in a way that would cause to display the 123.RSC menu tree?

A. Where? In the book?

Q. In the program when you're running it.

A. No. The product out of the box doesn't display the 1-2-3 menu tree. A decision was made not to do that.

Q. In order to cause the 123.RSC menu tree to appear as a user, you can load the program typing Q 1-2-3, can you not?

A. That's correct.

Q. And then you will see the 123.RSC menu [101] tree, correct?

A. Correct.

Q. And that is based on Lotus 1-2-3 menu tree, correct?

MR. GREGORIAN: Object to the form, based on.

Q. Where does it come from?

A. It is designed to be one that is compatible with Lotus's command sequence. What it means is that it would run Macros compatibly.

Q. It will also cause the program to display on the screen a sequence of menus using words from 1-2-3?

A. That's true.

Q. Now, was that understood when the decision was made when the product was in beta?

A. Yes.

Q. Prior to that, did the product have that ability?

A. The product for quite some time before beta had the ability to display any menu the user chose.

Q. But did it have preset a menu tree comparable to the 123.RSC menu tree?

A. That's not the product. There's a menu that looks—that is a superset of the 1-2-3 [102] command sequence but it has nothing to do with the product, at least the way I define product.

Q. I don't want to bog down on that difference at the moment.

MR. GREGORIAN: Well, the witness views it as significant.

Q. Well, I'm going to try to get at the meaning a different way.

As the product went into beta—

MR. GREGORIAN: Wait for the next question.

Q. As the product went into beta, did Quattro contain a preset menu tree like the 123.RSC menu tree?

A. I don't recall. I don't believe. As it went into beta, I do not believe it did, no.

Q. When the decision was made to include the 123.RSC menu tree as the product finally shipped, it was understood that the 123.RSC file would display a menu tree like that?

MR. GREGORIAN: Like what?

MR. KONRAD: Like the 123.RSC menu tree that it displayed when it finally shipped.

MR. GREGORIAN: Well, you either got a totality or you got a question. I don't understand. I object.

[103] Q. You knew when you were making the decision that you were going to display menu trees that had the words in the order from 1-2-3?

MR. GREGORIAN: Object to the form. That's not his testimony.

Q. Isn't that right?

MR. GREGORIAN: Object to the form.

A. I knew that in order to be 1-2-3 macro compatible, the simplest solution by far was to write a menu tree that insofar as its commands were compatible with Lotus was in the order the Lotus's was in, and at least began with the same first letters that Lotus's began with, and the easiest technology to be macro compatible by far at that point in the product was to implement such a tree. And, yes, one of the corollaries of that

is that the user will then see that menu instead of the normal Quattro menu.

MR. KONRAD: Could I hear the answer back.

(Record read as request.)

Q. As best as you can recall, that decision occurred in 1987?

A. Yes.

Q. And as best as you can recall, whatever work was necessary to turn the product from what it had been where it didn't have that ability in order to [104] give it the ability to display menus that had 1-2-3 compatible menu commands in them occurred in 1987, too?

A. No.

MR. GREGORIAN: Object to the form.

A. The product did not need to be converted in order to do that.

Q. Whatever work it took to allow the product—

MR. GREGORIAN: Could we try and save some time here? If instead of referencing back to your client's product, you would just ask him in terms of whatever work it took to display the 1/2/3.RSC tree, because when you refer back to Lotus commands, you invariably generate an objection. I think what you want to know is when was the work done that was required to implement in the product the 1/2/3.RSC tree and if you don't muck up the question with reference back to Lotus commands, I think you will get that answer and you can go on to whatever else you want to ask.

MR. KONRAD: I hear you and all I really want to get is when was that work done. However, it is a little hard for me to take that objection seriously when I am looking at a chart from the [105] Quattro reference guide which says "Menu items with square bullet indicate Quattro extensions to Lotus 1-2-3 menus." So whatever carefulness you are using now, whoever wrote this didn't seemed to be quite so persnickety about it.

MR. GREGORIAN: Whoever wrote it—

MR. KONRAD: Did it on behalf of Borland, I'm sure.

MR. GREGORIAN: —wasn't in a lawsuit and wasn't subject to having lawyers misconstrue it.

Q. When was the work done to permit Quattro to display the 1-2-3 menu tree?

MR. GREGORIAN: Object to the form.

Q. The 123.RSC menu tree.

A. Thank you. There was no specific work done with that 123.RSC in mind except in a very small amount during beta; one, no specific work done with 123.RSC in mind. I don't know how to say that better than that. There was work done to support allowing anyone to build any .RSC and that's where the work went.

MR. GREGORIAN: He's asking you a time. Maybe I can help. He's asking you a timing question. He wants to know when the work that Joanne Lin and Al did, whatever work it involved.

[106] A. Is that what you want to know?

MR. GREGORIAN: To—

Q. Now, I want to make sure I have this straight. When the product went into beta, it had some limited version of the 123.RSC file which did not display the 123.RSC menu tree in full, at least, correct?

A. I believe so. This wasn't a big deal to me.

Q. Somebody had to do some work to allow that to happen later on?

A. But not programmers.

MR. GREGORIAN: He is not asking who. He's asking when.

A. It wasn't under my control. I know when it was during the beta process.

Q. In '87?

A. Yes.



Q. What kind of work would it have taken?

A. Filling in the menu tree, using the menu builder and a very small amount of programming.

Q. How would you have used the menu builder to fill in the menu tree, as you put it?

A. Same way as you use the menu builder to build any menu tree in Quattro.

[107] Q. Describe how you would have created this 123.RSC tree using the menu builder.

A. Can I do that?

I would run menu builder from within Quattro. I would then, for each menu item in the first pop-up, describe the words that I wanted to see and either the associate action to take, if any, or the menu to go to, in this case virtually all of them ut one, go to a menu. Then, I would go menu by menu and do exactly the same thing until I was done. It's a boring and a tedious job, but it's not programming.

Q. I think what you have been trying to make clear to me is that the tools for allowing the menu items to perform associated actions were already in the product.

A. Yes.

Q. You had already defined through the menu equivalent commands, a set of actions which was sufficient in scale to look into this 1/2/3.RSC menu tree?

A. Virtually that's correct.

Q. I understand.

A. Okay.

Q. Now what you're telling me, though, is someone sat there and said main menu first item [108] worksheet?

A. That's correct.

Q. And then gave it the associated action?

A. Well, in this case they then added a menu.

Q. And go to another menu?

A. Yes.

Q. And then it says Range and did the same things and all throughout the menu tree?

A. Yes, that's what I'm telling you.

Q. Could a person have done that using just Quattro at that time?

A. Yes.

Q. I guess what I mean is where would they have gotten the words from.

A. Oh, I told you I thought they used that book.

Q. The intent was, though, to make sure that the menus insofar as they were the same as in 1-2-3 would appear in the same order and arrangement, isn't it?

A. The same order and arrangement is necessary just for macro compatibility.

Q. That was one of the implications of having the 100 percent macro compatibility that people talked about?

[109] A. Absolutely.

Q. And that became a design goal for the product?

A. Yes.

Q. Now we're looking here at the 123.RSC menu tree from this Quattro Reference Guide. We'll mark it in a minute. Do you know who created this diagram?

A. No. I remember it being drawn but I don't remember who did it.

Q. Did you check it? Did you review it?

A. No.

Q. Do you know of anyone who did?

A. I'm sure testing did it.

Q. To your understanding, they test it against the 1-2-3 menu tree?

A. I don't know how they tested it.

Q. During that beta period when the decision was made to go to that extent of macro compatibility, did Borland, to your knowledge, do any marketing research or studies, something of a formal nature?

A. No.

Q. Do you know of anyone else maybe that you weren't directly involved with that had provided some advice or thinking on the subject?



MR. GREGORIAN: Apart from what he has [110] already testified?

Q. Yes. I am asking for hearsay now. Did you hear anything from anyone else?

(Discussion off the record.)

A. The answer to that question is no.

Q. Who made that decision during the beta process?

A. Which decision?

Q. The one to include the 123.RSC menu tree in a way that displayed the menu commands.

A. I told you, once we decided to be macro compatible, that was the easiest mechanism for implementing it. I made the decision to be macro compatible and that was the easiest and most cost-effective way I could think of for making that happen.

Q. Did you submit that decision to Mr. Silverberg or Mr. Kahn for review?

A. Not that I can recall.

Q. Had that been a possibility that was previously discussed—

A. Yes.

Q. —within Borland?

Do you recall when?

A. I believe—and this is a very approximate [111] date—it was around April of 1987.

Q. Do you recall particularly how the subject had come up at that time?

A. Yes.

Q. How?

A. There was a suit by Lotus against VP-Planner.

Q. How did that affect you?

A. I told Phillipe that it would be possible to run 1-2-3 Macros quite easily without it having to be an integral part of the product.

\* \* \*

[113] Do you recall whether Mr. Kahn had any response to what you told him?

A. To the best of my recollection, the agreement that was made was we would make sure that the product in no way had the 1-2-3 command sequences as an intrinsic part of the product and we would deal subsequently with the issue of whether to expose a 123.RSC at all later.

Q. Now, later you decided to expose the 123.RSC menu structure, correct?

A. That's correct.

Q. Did you ever discuss that later decision with Mr. Kahn?

A. In what context?

Q. At all.

A. Yes.

Q. How?

A. We were talking about what should and shouldn't be in the product.

Q. Can you expand on what that conversation involved?

A. There was a question about which file [114] translators we needed, which graphic printers we needed and which RSCs we should include.

Q. Do you recall around when that occurred?

A. It was very late in the game. To the best of my recollection, it was on the order of September, October of '87. It may have been earlier but that's as close as I can come.

Q. Was there anyone else involved in this discussion?

A. I believe Brad Silverberg and Joanne Lin were involved.

Q. On the particular subject of which RSCs to include, do you recall Mr. Kahn's point of view if any?

A. No, actually I don't. I recall the discussion but not what his point of view was.

Q. Do you recall any particular disagreement on that subject?

A. Which RSCs to include?

Q. Yes.

A. Yes.

Q. What was the disagreement?

- A. There was discussion about a SuperCalc RSC.  
 Q. Did you have one developed?  
 A. We had one in development.

\* \* \*

[121] than the one that came before it, than the products that had existed heretofore, and any menu in technology will inevitably have its own implications upon the user interface because any menuing technology requires different alternatives based on its limitations. And in my judgment the optimal layout of commands given the menuing technology that I chose for Quattro—and I explored many—was the one that the Quattro menu embodies. So, to me, this 123.RSC sequence is fully not optimal. It was merely a migration tool to get over people's fear of flying, if you will.

Secondly, I had a profound belief that a product should never hard code the user interface that it exposes where it can be reasonably avoided based on my prior development, and Quattro embodied my attempts to make that possible. So, to me, what was integral to the product was the generic technology that allowed the product to function against a variety of different interfaces, including language translations and including customized interfaces by customers. That was what was integral. Some particular interface that either we chose to export or someone else chose to export, to me, is not integral to the product unless that interface optimally reflects the technology [122] that's used and is documented and is explained in the help system, and that was the Quattro RSC. That's what I mean.

Q. I even think I understand. No insult to you but I'm trying to follow along.

How difficult would it be to take out the 123.RSC file from Quattro?

A. To take it out?

Q. Yes.

A. How difficult would it be?

Q. Yes.

A. You mean how hard would it be not to include it in the product?

Q. What would it take to take it out?

MR. GREGORIAN: Physically?

A. As a physical file, you would simply not include it on the disks.

Q. So it would simply be to compile the product for release but leave out that file?

A. That's exactly correct. Not one line of code would have to be changed.

Q. Would that affect any other operation of Quattro?

A. Yes.

Q. What?

[123] A. 1-2-3 macro compatibility.

Q. But with respect to the Quattro menu tree or the execution of the menu equivalent command or any of the other components?

A. Not in the slightest.

Q. Just couldn't run 1-2-3 Macros or see the 123.RSC menu tree?

A. That's correct.

Q. Was that any part of your thinking at the time, that this was something you could get rid of quickly?

A. Yes.

Q. Why was that a factor?

A. In case there was some sort of legal issue. It was clear that it would be easy to change the product to not include that sequence or to not include it as an exposed RSC file.

Q. Forgive me for suggesting if it's too personal, but it sounds like you take a certain amount of pride in the Quattro menu tree.

A. Yes.

Q. Do you consider yourself the designer of it?

A. Yes.

Q. Do you think it's better than the 1-2-3 [124] menu tree?

A. Much.



Q. It's different, isn't it?

A. Yes.

Q. In fact, because of the menu build—Well, you helped create the menu builder, too?

A. I built it.

Q. And through that, any user can create their own menu tree that will tap into the same functionality, right?

A. Yes.

\* \* \*

[125] Q. You don't feel the 123.RSC menu tree is an optimal solution to designing a menu tree that would effectively exploit the functionality that Quattro provides?

A. I don't think it's optimal for new users or serious users. I don't know if that's responsive.

Q. No, I understand. What you are saying is it might be optimal for people who are entirely familiar with 1-2-3?

A. In the beginning, it might be.

Q. When they come to Quattro first, this might be the better way for them to approach it?

A. That's correct.

Q. But the expectation is that they will move into the Quattro menu tree?

A. That's correct.

Q. That's what you hoped, at least?

A. That's correct.

Q. Should we take a quick break now?

(Recess.)

[126] Q. Before Quattro was commercially released, did you have any sense as to how many people you expected to use the 123.RSC file as opposed to the Quattro file?

A. Yes.

Q. What did you expect?

A. I expected that over time less than 20 percent would use it.

Q. Use the 123.RSC file?

A. That's correct.

Q. How about at the beginning?

A. Even in the beginning I expected a majority to use the Quattro menu tree, a substantive majority, on the order of 60 to 70 percent.

Q. Did others within Borland have different views?

A. Yes.

Q. What do you recall?

A. Well, people talking to the press giving different opinions and were relaying them to me. I don't know if they necessarily agreed with what the press were saying but they were relaying different opinions. The person who had the most different opinion was Rob Dickerson.

Q. What was his opinion?

[127] A. I don't know what percentages he would have put on it. He didn't agree that a vast majority would use the Quattro menu.

\* \* \*

[128] Q. Do you recall whether the people that you spoke to, the people who expressed an opinion about having 100 percent macro compatibility also expressed such opinion as to what proportion of Quattro purchasers would use the respective menu trees?

A. Yes.

Q. What do you recall in that regard?

A. I recall some of the people we spoke to thought that a majority would use 123.RSC. Some of the people thought a large majority would use 123.RSC.

Q. Do you recall any of those who thought a large majority would?

A. I had my recollection refreshed yesterday and I now recall one of them.

Q. Is that Cobb?

A. No.

Q. Who?

A. Jared Taylor.

\* \* \*

[140] Q. Can you give me an example of how they would indicate that?

A. By way of example, macros that were invoked using Alt in a character could be considered to be 1-2-3 macros.

Q. If you did that, then you could use another menu structure and another macro language but you just couldn't use the Alt character indicator to begin that macro?

A. Yes and no.

Q. How no?

A. In Quattro, macros include macro debugging. I don't know how you would support macro debugging without a menu tree that conformed to the macro interpreter's expectations. So, yes, you could do it but it would feel broken.

Q. Let me make sure I understand that. If you didn't want to provide a macro debugger, you could do what I suggest?

A. I'm not sure what it means, provide macros without a macro debugger. If you mean if I want to provide macros without a macro debugger, the answer is yes.

Q. Well, the macro debugger perhaps needs more explanation. What do you mean by that?

[141] A. Macro debugger is the ability to test and fix logic bugs in the process that the macro describes, without which, it is in my opinion, virtually impossible to write reliable macros.

Q. Let me see if I can put it into a more ordinary—if not, let me know—but using that hard coded interpreter and not having the 1-2-3 menu tree somewhere would mean that the only way that the user could work with the 1-2-3 macros was simply to execute them cold but they couldn't fix them, work on them, modify them. Is that what you're saying?

A. I wouldn't call it the 1-2-3 menu tree. But other than that, I would agree with that statement. I would just say generically if I provided a macro interpreter without debugging, the implications would be that you could run the macros but not understand what went wrong when something went wrong.

Q. You couldn't fix them, you couldn't modify?

A. Not without great difficulty.

Q. So I take it that back in that exploratory decision in '85 you determined not to follow alternative—

A. '86.

Q. I think this is the October to December '85.

\* \* \*

[144] Q. What do you mean?

A. I mean Lotus.

Q. What do you mean?

A. I mean as I understand it, Lotus has announced a new product where they said the standard interface is now 1-2-3 keystroke compatible but they will be 1-2-3 macro compatible so I assume there is some macro technology underway.

Q. What product are you referring to?

A. There was a press announcement about 1-2-3W.

Q. If you hard coded the interface into the product including all the keystroke information, could you provide the ability for the user to essentially turn a switch and start typing on the keyboard and have the program respond as if you were using the product whose interface you had hard coded?

A. It's conceptually possible to do anything in programming. It's just a question of effort. It depends on how much time and how much space you want to take.

Q. I guess I'm trying to get at the difference between having the interface hard coded into the program and in a display. Would it be possible to provide the ability for a user to invoke all the same [145] keystroke commands but not display the menus and the like—

A. It would be possible. It could cause cognitive dissonance.

DISSONANCE. Cognitive is COGNITIVE.

Q. What do you mean by that?

A. What I mean by that is you would get no feedback into what you were doing and you would get completely lost and not understand where you were within the product.

Q. You being the user of the program?



A. Yes, yes.

Q. And that's because the display of the information in the user interface helps give you the context for where you are in the product?

A. You bet.

Q. And conveys information to you about interacting with the program, doesn't it?

A. You bet.

Q. Well, bear with me. I was just scanning through my notes to try to find where we touched on it before, but if we're overlapping, excuse me. I just want to come at it now having explored these points in more detail.

[146] What was the difference between the alternatives that we've just discussed and the alternative you discussed with Mr. Kohn around April of '87 in terms of how to achieve macro compatibility?

A. I don't know that it was April. I don't remember my comment. I don't recall it being around April. Do you mean—and I'm not quite sure which discussion you mean.

Q. You made reference to one time when, after the Lotus against Paperback suit, you mentioned to Philippe Kahn that there was a way to provide macro compatibility without displaying the menu tree.

A. That's right.

Q. How is that or how is what you were discussing there different from what we have just gone through?

A. It's different. The—

Q. Could you tell me how?

A. Once you have the technology that's in Quattro I—I don't know about Pro—which is essentially user interface independent technology, it's possible to tell the program to temporarily switch to an alternate interface, execute against that interface and switch back. The problem, as I've mentioned before, is you can't completely suppress [147] that interface because of debugging but you can make the interface one which is not exposed for the purpose of direct interface with the end user, and that solution I just described

uses the user interface independent technology rather than the hard coded user interface technology or the hard code standard interpreter technology.

Q. Now, when you use the term user interface independent technology—

A. That's correct.

Q. —what do you mean by that?

A. I mean that in large subset of what I earlier defined as user interface, it's described by the RSC file and that subset can be completely changed at will by building a different RSC, RSC file without affecting the product.

Q. And in your view Quattro was an example of user interface independent technology?

A. Quattro what?

Q. Quattro as released Quattro I.

A. No, we shipped an interface. It wasn't user interface independent. It was just that the code didn't depend on that interface. That was the ideal interface for the code.

Q. Although to some extent because of the Menu [148] Builder you did provide the ability for users to treat the product as if it were user interface independent?

A. Yes, it is user interface independent. I just don't think it's correct to say that Quattro was shipped being user interface independent. It did ship with interface and the documentation is very much dependent upon that interface.

Q. Do you recall whether there was ever any consideration given prior to the release of Quattro to document the 123.RSC menu tree?

A. There was some consideration given.

Q. Do you recall who considered that?

A. I don't recall the details but I do recall Mr. Dickerson considering it.

Q. Did someone decide not to?

A. Yes.

Q. Who?

A. Me.

Q. Why not?



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A. In my opinion it was not a good interface. It was not the interface that I wanted users to use because I didn't believe it was the ideal or even a comfortable interface for most users using Quattro, and I did not want our imprimatur upon the user interface.

J.A. 567

[182] IN THE UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS

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No. 90-11662-K  
Civil Action  
VOLUME 2

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LOTUS DEVELOPMENT CORPORATION,  
*Plaintiff,*

—against—

BORLAND INTERNATIONAL, INC.  
*Defendant.*

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DEPOSITION UPON ORAL EXAMINATION  
OF ADAM BOSWORTH

---

SPECIALLY CONFIDENTIAL MATERIAL  
ATTORNEY EYES ONLY

9:55 a.m.  
April 30, 1991  
5400 Columbia Center  
Seattle, Washington

Mary A. Hall, CSR,  
Court Reporter

\* \* \*

[191] WITNESS: ADAM BOSWORTH 4-30-91 (VOL. 2)

For example, again using the idea of copying from a source block to a destination block, if one had different words for source block and destination block.

Q. You mean command words?

A. I mean words that would appear up on the top or the bottom of the screen but the order of the prompt and the semantics of the prompt were the same, then the instructions in the RSC file would be identical in terms of the order and the semantics to take. They would only differ elsewhere in a different part of the RSC file as to the exact text to display at that point in time. The reason this is important is this describes a fundamental behavior on the part of the product as opposed to any more trivial issue such as the exact words. And even the fundamental behavior I am saying is not part of the product intrinsically. It is described by the RSC file and the 123.RSC file would have to describe in totality to Quattro the fundamental behavior to take quite independently of what words it chose to display.

Q. I think I finally got it. Let me try it a different way and if I didn't, don't worry about it.

To some extent it sounds like what you are saying is that the 123.Alt file would not be a mode [192] that you would want a user to try to operate exclusively within because it may have been that not every single part of the Quattro functionality was enabled in that since it was really just known as a way to provide Macros and coming back to the Quattro menu tree?

A. That's my recollection. Now we had some internationalization issues with the Alt file late in the game and I don't remember precisely what ended up in the ALT file and what did not.

Q. Going back to an answer you gave me before, you said only the first letter is necessary to display to permit Macro execution. Why then does Quattro in the 123.RSC and ALT files display the full word?

A. In the ALT, I don't know that it does. I can take your word for it if you would like. In the RSC the goal was to kill

two birds with one stone and with one piece of technology. One goal was to allow for 100 percent macro emulation and for that only the first letter would be required.

The other goal was to make it possible for users who were familiar and comfortable with a different command sequence to migrate to Quattro without having to learn a new command sequence immediately, and for that second goal one wants to have [193] fully spelled out words.

Thirdly, I have alluded to debugging, and to debug a command sequence it is highly desirable to have as much information in the commands that appear while you're debugging as possible and that alone I think would be sufficient justification for fully spelling out the words at least in the commands. It might not be for the long prompts.

Q. Focusing just on those commands, both for the purposes of debugging and for how long users who were familiar with the 1-2-3 menu commands to migrate to Quattro, displaying full words in the menus gives them more information, makes it easier for them to use the product, right?

A. Than what?

Q. Than if all you used was the first letters which was all you needed for Macro execution, technically speaking?

A. No.

Q. Why not?

A. The ALT file, at least to my recollection, is not used as a primary interface.

Q. We're talking about the RSC I thought. You said you didn't know about the ALT we're talking about?

[194] A. For the RSC file yes, sir. If one is going to use an interface with commands, one wants the command as easy as possible.

Q. And having a full word is more helpful than just having first letter, right?

A. Yes.

Q. And just to pin it down, it's more helpful because it gives more information, right?

MR. GREGORIAN: The words give more information than the first letter?

MR. KONRAD: Yes.

A. Yes. That's not the only reason it's more helpful. It's one reason it's more helpful.

Q. Why else is it more helpful?

A. It's also more helpful because it's a reference to remember where you were in some command sequence.

Q. It helps you stay in context of where you are in the command sequence or menu structure, right?

A. Yes. Maybe that's what you meant by the first point.

\* \* \*

[215] Q. Why then did you not try to encourage that right away by not including the 123.RSC menu tree at all?

A. How does that encourage it?

Q. Why not sell it by saying we have a menu tree, use it, convert now.

A. That doesn't encourage it.

Q. There is nothing in Quattro that will automatically convert your 1-2-3 macros into Quattro macros, correct?

A. That's correct.

Q. You could do something like that, couldn't you?

A. No.

Q. Excel does something like that, doesn't it?

A. It doesn't work.

Q. It works somewhat?

A. Can I answer this question, if I buy a car that runs 90 percent of the time and ten percent of the time I'm on the highway and it shuts down, I don't say to myself the car works 90 percent of the time. I say to myself the car doesn't work. It's that simple.

[216] Q. Have you analyzed the section on which Excel translates the 1-2-3 macros?

A. No, I have not.

Q. So 90 percent of the time, ten percent of the time analogy is not based on any estimation you have made based on the percentage of macros. That—

A. It's not made on any percentages that macro can translate of Excel.

Q. It's just numbers that you threw out for analogy?

A. No, that's not correct.

Q. Where do you get the 90 percent number?

A. I looked into translation.

Q. Of Excel?

A. No.

Q. For purposes of Quattro, you mean?

A. Yes.

Q. When was that?

A. I don't remember exactly.

Q. Do you know which macros from 1-2-3 Excel cannot automatically translate?

A. No, I don't know.

Q. Do you know any of the conditions in such macros that impede the Alt translation?

A. Certainly.

[217] Q. Which one?

A. Any self modifying macro.

Q. What percentage of macros would you say include self-modifying macro conditions?

A. Ten percent.

Q. What's that ten percent based upon?

A. My experience with writing, looking at and talking to customers, writing macros.

Q. And you would say you're an experienced macro writer?

A. No, I don't think I would say I was an experienced macro writer.

Q. But you are technically an experienced person?

A. I am a technically experienced person, yes.

Q. And the customers you talk to, are these the same experienced spreadsheet users you mentioned yesterday?

A. Yes.

Q. Did you talk to any novice users about the problems of translating self-modifying macros or the extent to which they use self-modifying macros?

A. No.



Q. Would you expect a novice user to use a self modifying macro?

\* \* \*

[256] Q. I understand, but what might have happened is that you you would create something like the 123.RSC file. It would never be included in the product but just to make sure that the macro compatibility would work.

A. That might have been happened.

Q. But it seemed you had to find some solution of that type in order to test the Menu Builder?

A. Yes.

MR. KONRAD: I ask the reporter to mark as Exhibit 10 a one page-document bearing the production number 558088.

(Marked Deposition Exhibit 10.)

Q. Now, if you take had a look at this, does this appear to be something you recognize?

A. I have seen this before.

Q. Do you recognize this as a piece of electronic mail that you received?

A. Yes.

Q. You'll see in the first sentence it refers to the 6/8 version of MT. Is MT Mark Twain?

A. It would appear I was mistaken about the sequencing of Palm Springs and Mark Twain.

[257] Q. Or it's also possible the person was using the old code name. Do you recall at this point?

A. I don't recall. I just know we had both versions. I don't recall the sequence points.

Q. Whichever sequence this came in, they're the same product?

A. Uh-huh.

Q. Fair enough. The memo says in the second paragraph: "I like the new menu's look much better. It's a much cleaner screen look." Do you have an understanding as to what "new menu's look" is referring to here?

A. Yes.

Q. What is that?

A. Three things. Number one, the menu, not that much earlier had automatically displayed sets which made them wide and they had been fixed to display narrow unless they asked to wide settings.

Two, at some point not that long before there, they had displayed on the left side of the screen, not the right side of the screen, and they had been moved to the right side of the screen.

Q. That's where they would appear when they popped up, as you called it then?

A. Right. And three, we are constantly [258] thinking we are tuning the actual sequence of commands to be included in the Quattro interfacing. This was yet another go-around.

Q. When you say Quattro interface there, you specifically mean the Quattro menu commands from the Quattro RSC files?

A. I mean specifically Quattro RSC.

Q. Right. Now, this memo appears to contain some discussion about where commands should be in the menu tree, how they should be placed. Do you recall much discussion with Mr. Silverberg on that point?

A. I already testified I had discussion with everybody on these points.

Q. And there was back and forth as to where these things should go?

A. Absolutely.

Q. Any idea how many such discussions?

A. Not precisely.

Q. Too many to count?

A. On the order of a hundred.

Q. Any idea how long it took to finally settle upon a Quattro menu tree?

A. To finally settle upon it?

Q. Yes.

A. Yes.

[259] Q. How long?

A. Approximately a year.

Q. Any idea how much work it took? By any measure of work, you can give it man-hours, days.

A. It wasn't that much work. It was just—

Q. Just a lot of thinking?

A. No. It was just lot of iterations. Man-hours, I wouldn't—

Q. Iterations is kind of a computer term but it means a lot of different tries, a lot of different experiments to see which was better?

A. Getting a lot of different people's judgment. I don't know exactly how much work on it.

Q. But over a period of time various communications occurred and eventually it was settled upon?

A. Yes.

Q. The third paragraph, I guess, says: "While it's nice to make the top menu alphabetic, it doesn't work so well in practice." Had the top menu of the Quattro menu tree been in alphabetic form up to that point?

A. Yes.

Q. As shipped, it's not quite, is it?

A. No.

\* \* \*

[265] Q. I understand but now you have had a chance to see this again.

A. I don't remember the precise timing any better seeing this.

Q. You have no reason to believe that the 123.RSC file started before July 4th?

A. No, that's not true.

Q. It may have been done?

A. Yes.

Q. But it wasn't done by then? At least that's what this memo suggests.

A. It's what this memo could suggest, yes.

Q. Do you think it was done by July?

A. I don't remember.

Q. But do you recall working with Joanne Sakai Lin on the 1-2-3 menu tree following this memo?

A. I recall working with her on it. I don't recall the timing.

Q. What do you recall doing with her?

A. She would call me up and say I need that command to do such and such and I don't see where this command is in the Menu Builder. And then I would either tell her or I would say whoops, you are right. This is one one case where we would have to add one [266] and I would add a command. There were a few such instances.

Q. These were commands from 1-2-3 that she couldn't find an analog in the menu equivalent commands for?

A. Yes.

Q. So you would have to create a new menu equivalent command to address that?

A. Yes.

Q. Do you recall any specific such commands?

A. No.

Q. Do you recall approximately how often that came up?

A. There were fewer than ten, is my recollection.

Q. When she'd call up, would she describe the command by the word from 1-2-3, I don't see anything that's equivalent to File Range, whatever?

A. My recollection is that most of them had to do with the status menu. They weren't really commands.

Q. But you recall this coming up with some real commands?

A. Printing. I don't remember the details.

\* \* \*

[301] A. He was very vague. He wanted to build a great spreadsheet. He wanted to have great charting. He wanted to have great math stuff, minimum recalc. That was about it.

Q. What you have described, did that occur in one conversation or more than one conversation?

A. There were essentially three conversations.

Q. During any of those conversations at or about the time you joined the company, did Mr. Kahn indicate that one of his objectives was to create a Lotus clone?

A. No.



Q. Did he indicate that one of his objectives was to create a product that looked just like the Lotus product to the user?

A. No.

Q. At any time at or after you joined the company, was it your objective to create a Lotus clone?

A. Absolute—

MR. KONRAD: Sorry. I object to the form.

A. Absolutely not.

Q. At any time after you joined the company and began working on the spreadsheet product, project, was it your objective to produce a product that would [302] appear very much like Lotus to the user?

MR. KONRAD: Object to the form.

A. I'm not sure what you mean by that question.

Q. At any point was it your objective to create a spreadsheet product for Borland that had a user interface that was identical to the Lotus interface?

A. Absolutely not.

MR. KONRAD: Object to the form.

Q. In terms of your own goals and objectives for the spreadsheet project, what were they?

MR. KONRAD: Ask for clarification. At what time are you talking about?

Q. Let me rephrase it. At or about the time you joined Borland, did you establish some objectives or goals for the spreadsheet project?

A. Yes, I did.

Q. Can you tell us what those were?

A. Yes. My key objective was to use the Borland languages as an extendibility mechanism for the applications with the product being envisioned as the first in a family of applications. A secondary objective was to have a superset of the charting capabilities of Harvard presentation graphics so that [303] users could do charting, real charting, without having

to buy a different product and then import data from one product into another.

Q. Any others?

A. There were numerous others but those were the two key objectives. The other were basically just to do a bunch of things much better for the spreadsheet user than any product had done before and that included macro recording, macro debugging. It included a better menuing system. It included extensibility things like functions. At the time it was intended to include multidimensional worksheets. Those were my objectives.

Q. Were some or all of those objectives that show in the Quattro product that was released in 1987?

MR. KONRAD: Object to the form. I think he said Quattro problems.

A. No.

MR. KONRAD: In any event, I do object to the form.

Q. Let me restate the question. Were any of those objectives achieved in the Quattro product that was released in late 1987?

A. Many of them were achieved technically.

\* \* \*

[328] Q. Do you recall when in time you reached the conclusion that a pop-up menu presentation was the one you wanted to use in Quattro?

A. Yes.

Q. When was that?

A. It was approximately February of 1986.

Q. Do you recall when in time you began designing the Quattro menu tree?

A. Yes.

Q. When was that?

A. It was approximately February of 1987.

Q. Was there a reason that you began the Quattro menu tree design as late as you did?



A. Yes.

Q. What was the reason?

A. In my experience building products, it's unproductive and fruitless to worry about the sequence of commands until you understand both the presentation of the commands and the set of commands that will be available. And any attempt to try and finalize that command sequence before that is a pure waste of time [329] and even is misleading to people such as documentation, so I make it a policy not to define or worry about command sequences until such time as the presentation and the functionality are either finalized or close to finalized.

Q. And you did that in this particular instance?

A. Yes, and I did that in this particular instance. There is a second reason on this particular case.

Q. Okay.

A. I don't want to get into a debate with people about the exact words. There was an experience I went through at Analytica which I referred to as the UI Wars where extraordinary vituperative and vicious internecine warfare would go on about the particular order of a word or even a particular word in question, which was one of the most unproductive spectacles I had ever witnessed in my life and I wanted no part of it.

I didn't want, therefore, to design the Quattro command sequence until such time as the Menu Builder was done. And, for example, Philippe gave me a hard time—and in fact this actually happened—said here's a Menu Builder. Go design one that's [330] better and come back and we'll talk about it and finalization of both long prompts and commands to someone who is a better wordsmith than myself and I needed the Menu Builder in order for that to be possible.

Q. The point being, I take it, that once you had the Menu Builder it was relatively easy to change the command terms.

A. It was trivial except for the implications upon documentation.

Q. But if, for example, Mr. Kahn didn't like your choice of the word Copy, it was trivial to use the Menu Builder to change it, to duplicate or something like that?

A. Exactly.

Q. Now, I take it that what you have just described was not the only reason that the Menu Builder was written.

A. It may not have been the only reason but it was probably the primary reason.

Q. Did the Menu Builder have anything to do with the user customization capability of the product?

A. Yes, it did. As I said before, I believe that users are heterogenous in nature and their commands will vary. Also, I wanted a way for users to [331] splice both add-ins and macros into a user tree so a user could deliver to another user an application that seemingly integrated into the menu tree and the menu tree allowed me to deliver, deliver that functionality. Also, it allowed me to deliver the tree needed for 1-2-3 macro compatibility. So there were a variety of reasons but I would say the main reason was to stay out of the U.I. Wars.

Q. When did you design the Menu Builder?

A. To the best of my recollection, between January and March of 1987 is when I actually designed and wrote the Menu Builder.

Q. Is it fair to say that at that point it had not been decided that the product would incorporate what eventually became the 123.RSC menu tree?

A. It's fair to say we hadn't even thought about it one way or the other.

Q. My point being that you did not set out to build the Menu Builder so that you could incorporate in the product what eventually became the 123.RSC menu tree.

A. That's correct, I did not.

Q. And the Menu Builder had other purposes and was used for other purposes besides that, correct?

A. Yes.

[332] Q. And those are the purposes you described?

A. Yes, to allow for civilized dialogue about the menus that we ship.

Q. Did it improve the quality of the dialogue or did it just allow you to say if you don't like it, fix it?

A. No, it actually improved the quality of the dialogue.

Q. Now, you had given some testimony yesterday, the substance of which as I understood it was that the menu technology chosen dictates or constrains the eventual menu organization. Do you recall that testimony?

A. I recall the testimony.

MR. KONRAD: I object. I think it mischaracterizes his testimony. I don't remember him using the words dictate or constrain.

Q. Let me substitute the word everything. Do you recall testimony yesterday to the effect that the menu technology affects the optimal menu structure in organization?

A. What I recall saying, though perhaps not in these precise words, was that the presentation of the menu has a major effect of the choices one makes for the layout in grouping of commands.

\* \* \*

[338] A. I think it would be more correct to say I wasn't the principal designer or principal author of the long prompts.

Q. But you were the principal author of the command terms?

A. Well, in my own mind I was. I don't know that everyone else would have agreed.

Q. And how about this structure or the sequence and organization of the menu, were you the principal designer of that?

A. Yes, I was.

Q. With regard to your efforts in designing the Quattro RSC command terms and menu hierarchy, did you have some specific objectives or goals in mind that you were seeking to achieve by that design?

A. Yes, I did.

Q. What were they?

A. Well, first was for clarity. One is to have the terms be as self-evident as possible to as large an audience as possible; second, was shallowness of hierarchy. These are not necessarily in any priority of purpose as much as just goals, meaning that in general it would be ideal to take as few keystrokes as possible to reach the desired [339] command; third, which can conflict with that sometimes was to ensure that the more common a command the fewer keystrokes it took; and fourth was to logically group the commands for the purpose of showing logically grouped state or settings. Those were, I would say, the four key objectives I had.

Q. Is it fair to say that overall your objective was to design a menu tree that was as functional as possible?

A. Certainly.

MR. KONRAD: I object to the form.

A. Yes.

Q. And in executing the design, you attempted to achieve the four specific objectives that you just identified?

A. Well, I and others attempted to achieve it. It's a very pragmatic process.

Q. Is it fair to say based on your previous testimony that the objective of logically grouping the commands flowed from the decision to display associated states?

A. Not quite. It's fair—

\* \* \*

[347] Q. Mr. Bosworth, I'm showing you a document that was marked this morning as Plaintiff's Exhibit 10. This was the electronic mail from Mr. Silverberg. I take it Mr. Silverberg was one of a number of people who reviewed and commented on your menu tree design.

A. That's correct.

Q. He indicates in the first paragraph of this memorandum that some of the trade-off in this cleaner screen look is that he has to hunt for some commands that are, quote, buried a menu or two down, close quote. Do you see that?

A. Yes, I do.



Q. That, I take it, refers to the issue of a flat hierarchy versus one that is deeper.

A. You have actually refreshed my memory on something.

Q. Okay.

A. It does but not quite in the sense that I think you mean it. Originally—

Q. How does it differ?

[348] A. Originally I had a flatter hierarchy and a longer set of menus and you had to go down less frequently but you had more on the order of 13 or 14 items per menu and it was strongly felt by Philippe and some others, and really myself after I thought about it, that that was too many, that the menu was intimidating. And so the menu tree that the new menus included—I forgot one of the things the new menus included—was actually a deepening of the hierarchy to some higher degree. In the goal of a hierarchy, we had really gone too far.

Q. The result being that some menus contained, in your view, too many command terms?

A. Well, particularly I have to say—in all honesty I'd have to say in Brad and Philippe's view.

Q. I just want to understand the adjustment that was made. I take it the adjustment was reduce the number of command terms per menu and make the hierarchy a little deeper or a little less flat.

A. Right. It was a touchy trade-off.

Q. Why was it touchy?

A. Well, the more experienced a user, the fewer the keystrokes you want the user to have to type to accomplish a given piece of functionality, particularly if he is of high frequency. At the same [349] time, you don't want to completely intimidate and terrify the less experienced user and you don't want to obscure a larger fraction of the screen. So there is a trade-off there, as there usually is in user interfaces, between what's best for the novice and what's best for the expert.

Q. Is it fair to say generally that these criteria or guidelines or rules that you applied in designing the Quattro menu tree sometimes point in different directions?

A. Absolutely.

Q. And that that gives rise to trade-offs; that is, to achieve one objective, to satisfy one criteria, you have to sacrifice the other to some degree?

A. Absolutely.

Q. Is what we just talked about an example of that?

A. Absolutely.

Q. I take it that reasonable people can disagree on which rule ought to be sacrificed in favor of which other rule. Is that a fair statement?

A. Yes.

Q. And that happened in this case, that is, there were disagreements or discussions along these [350] lines?

A. There were discussions in this case.

Q. You had indicated before lunch that you began work on the design of the Quattro menu tree in February of '87. When did you finish?

A. I'm not sure I really finished until close to ship.

Q. Any idea what the total time commitment on your part was to that aspect of the project?

A. Probably overall about ten working days.

Q. Is it fair to say that notwithstanding what you've testified to earlier about user interface wars there never came a time when you handed the design over to somebody else and said just go do it? In other words, you were the principal designer from start to finish, I guess is my question.

A. That would be fair to say with respect to organization of the commands and the wording of the commands. It wouldn't be fair to say with respect to the long prompts.

Q. I understood from a previous answer that you would not regard yourself as the principal designer on the long prompts, is that correct?

A. That's correct.

\* \* \*



[358] Q. Why did you regard the ability to debug Lotus 1-2-3 macros as important as at the time Quattro was released?

A. In my experience, no programmer can properly maintain a test or guarantee the quality of their programs without some debugging strategy, and typically by far the most productive strategy in my experience is to have a debugger. I regarded then and I regard now Lotus macros as a programming language since they were used in the ways I'm familiar with programming language as being used, and as such I saw exactly the same need for these debugging tools, and every discussion I ever had with any customer who wrote and/or tried to debug Lotus macros only confirmed my opinion in this regard that the single biggest productivity gain I could give to people who were writing Lotus macros was a debugger.

Q. Now, you were asked yesterday about some alternative technologies, alternatives to the 123.RSC resource that was included in Quattro. And one of those that you identified in response to Mr. Konrad's questions was a hard coded interpreter. Do you recall that testimony?

A. Yes, I do.

Q. Now, had that solution been adopted by [359] Borland in lieu of what they did choose to do, what would have been the effect on the ability to debug Lotus macros?

A. It would have made it more difficult.

Q. How so?

A. When you are debugging a Lotus macro, not infrequently you have a command sequence which you expect to behave in one way and isn't behaving in that way because of a logical mistake on your behalf. And the only way to really understand that is to see the command sequence play out against the backdrop of the menu tree and understand where you made this logical mistake. Of a hard coded interpreter, there would be no such hard coded menu tree to play out against and therefore you couldn't display to the user at all what happens, what would then appear to be relatively mystical. Keystrokes were fed into the maw, M A W, of this interpreter.

Q. So in that situation any attempt to debug would be flying blind, so to speak. You could not step through the menu tree and determine where the logical error was. Is that what you're saying?

A. Any attempt to debug where viewing the menu tree would help with the solution, in my opinion then and now, is a significant percentage of the time would [360] be flying blind.

Q. Another alternative that was discussed in the testimony yesterday was hiding the menu, I think were your words. Do you recall that?

A. Yes.

Q. Would that have basically the same effect as you just described on the ability to debug macros?

A. Yes and no.

Q. Tell me how yes and how no.

A. The hidden alternative I described was one where there was an alternate resource file but it wasn't visible. In that case you actually could display the command sequence but the user would have no way to test it outside of the macro. There is a better debugging strategy than the one that we just described but it's still a much worse debugging than the one where the user can test fragments of the macro by hand using the same command menu tree that the macro is going to use and then debug it. So this is a less pernicious alternative but still limited.

Q. The third alternative that was discussed in the testimony yesterday was a hard coded interface that would be 1-2-3 macro compatible.

A. That's correct.

Q. What would the effect of that choice have [361] been on the ability to debug macros?

A. Well, the effect of that choice on the ability to debug macros would have been final, I mean the user would have been able to see one menu sequence and debug against it. A minor subnote is that that's the only interface that would have been available to the product and—

Q. Why would that be?

A. Well, if you write the code to hard code user interface, that's your user interface code. You are not going to write two totally different pieces of interface code. It's ridiculously expensive. Also, hard code user interface is a very foolish strategy in general but it doesn't necessarily adversely affect the macro debugging, per se.

Q. When you referred to that alternative yesterday and testified about it at some length, I take it you had in mind what you just described, that hard coded interface would be the only user interface offered, is that correct?

A. Yes.

Q. Did you also have in mind that under that alternative the Lotus menu tree would appear on the screen?

\* \* \*

[369] BY MR. GREGORIAN:

Q. Mr. Bosworth, you were asked some questions this morning by Mr. Konrad concerning the portions of 123.RSC that were necessary to support macro execution and you indicated in that regard that one of the portions that was not necessary was all but the first letter of the command terms. Do you recall that testimony?

A. Yes, I do.

Q. What effect would including a 123.RSC only the first letter of the Lotus command terms have had on macro debugging?

A. Only including the first letter would have meant that when they were debugging the macro, you would see a very, very skinny pop-up menu consisting of single first letters, and for most letters you would be pretty unlikely to have a good idea of exactly what each letter alluded to. And so again it would complicate the job of debugging the macro and make it less felicitous.

Q. In that situation, I take it it would have [370] been likely that the hypothetical person attempting to debug a macro would have had to at least on occasion go to some other course to figure out what the first letter stood for.

A. It would sort of be analogous to going back from 1-2-3 before they had words. Yes, it would be analogous. It would be possible. It would just be more clumsy.

Q. Just so we can define for Mr. Konrad the scope of what he believes he's been deprived of, how many meetings did you have with counsel for Borland at which the subject matter of a Lotus claim or the legality of releasing Quattro with the 123.SRC file was discussed?

A. While I was at Borland?

Q. Yes.

A. I can recall two.

Q. And I think you indicated yesterday that one or more of those conversations was with an outside law firm or representative of an outside law firm. Was it one or was it more than one?

A. That's a good question. I honestly don't recall if it was one or both now that I think about it.

\* \* \*

[389] Q. But what I mean to ask you is whether there is any technical constraint, in theory at least, that you know of which would prevent you from designing a program that displayed the same menu tree that's in Lotus 1-2-3 but using pop-up menus instead of ring style menus.

A. The identical menus, right?

Q. Yes.

A. No.

Q. Did the use of pop-up menus for the Quattro menu tree affect the arrangement of the commands within any given menu?

MR. GREGORIAN: I'm sorry. Can I just hear the question.  
(Record read as requested.)

A. Yes.

Q. How so?

A. There is a logic to showing associated state that would dictate that even within associated state, some state should be



coupled with another state and that would dictate a particular order even within a single menu.

Q. Now, I believe you have said several times something to the effect that you don't believe that there's any one user interface that would be [390] necessarily ideal for all users. Have I caught the gist of something you said?

A. You have caught exactly what I have said.

Q. Why is that?

A. I believe based on extensive experience with customers that customers' needs vary just as individuals vary. Customers' needs are heterogeneous and therefore the relative frequency with which a customer may perform an action almost varies from customer to customer. Any interface which is predicated upon the concept that making things that are most frequent most accessible and the least frequent the least accessible therefore has to vary from customer to customer.

Q. Do you think that some user interfaces have more appeal to some individuals and others have more appeal to others?

MR. GREGORIAN: Object to the form. I don't know what appeal means.

Q. Is the only respect in which different users might prefer different user interfaces the frequency with which they would use different commands?

MR. GREGORIAN: Look, to simplify this, apart from the appeal issue, you are not talking about [391] user interfaces, which he has defined very broadly. I think you mean menu tree. Maybe you don't but you're kind of switching gears on him.

MR. KONRAD: Well, actually, I don't mean to. I asked the question user interface. He mentioned with respect to commands.

Q. That's why I'm trying to now explore whether or not the only way in which you think that different user interfaces might have different suitabilities for different users has to do with the frequency with which they use particular commands.

A. I didn't mention menu trees. I mentioned commands. I would like to distinguish. That includes, for example, what the optimal function layout key is. The—no, that's not the only consideration.

Q. Well, do you think that some users just simply like one menu tree better than another?

A. I don't know what that means.

Q. Do you think that some menu trees might strike some users as more intuitive and logical whereas another user would have had another organization to think it would be more intuitive and logical?

A. Yes.

[392] Q. Do you think that some users might enjoy working with one menu tree more than with another?

A. Yes.

Q. Do you think some users might find one arrangement of a menu tree to be more informative to them as they're working with the program than another arrangement?

A. Yes.

Q. Do you recognize that there is some room for taste and personal appeal in designing a menu tree?

A. Yes.

Q. You told Mr. Gregorian that you don't know who wrote what we've been calling the long prompts in the 123.RSC file but you also told him you didn't think they were the same as in 1-2-3. Why do you think that?

MR. GREGORIAN: I'm sorry. Which file are we talking about?

MR. KONRAD: 123.RSC.

A. My recollection is that at one point I was asked to technically autoset the long prompts for the effect of picking the menu item was to go to a child menu, to the comma separated, child separated menu and I didn't do so. I thought it was a bad technology.

\* \* \*

[396] Q. Do the menu trees convey information to the user?

A. Sure. That's one of their functions.



Q. Now, if you recall, I objected at one point and I apologize for doing so but I cannot understand this term patterned usage that you kept using in one of your answers. You were talking about that in connection with the differences between the 123.RSC menu tree and the menu tree in the 1-2-3 product, and what I'd like to begin by asking you is what difference does the pattern of usage make, in your mind?

MR. GREGORIAN: Wait a minute. What difference to what?

Q. What difference to anything does the pattern of usage make? Why were you mentioning that term?

MR. GREGORIAN: Why did he include that in his answer that you argued gratuitously at the time?

MR. KONRAD: I object. I don't think that's fair.

MR. GREGORIAN: Why did you think that was so significant that you mentioned it?

\* \* \*

[399] is going to buy a Quattro would have a need at some point to run 1-2-3 macros?

A. I really didn't know.

Q. Do you mean to testify that you believed the only way to sell Quattro to include 1-2-3 macro compatibility?

A. What do you mean by the only way to sell Quattro?

Q. Do you think you could have sold some units of Quattro without the 1-2-3 macro compatibility?

MR. GREGORIAN: Do you mean like more than one?

MR. KONRAD: Yes.

A. I think I could have sold more than one unit of Quattro without the 1-2-3 macro compatibility.

Q. Then was it the only way for Quattro to be commercially successful, in your view, to include the 1-2-3 macro compatibility?

A. That's an overstatement.

Q. What do you think?

A. I thought it was—would have been a large, unnecessary risk to the commercial viability to sell Quattro without 1-2-3 macro compatibility.

UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS

Case No. 90-11662-K

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LOTUS DEVELOPMENT CORPORATION,  
*Plaintiff,*

v.

BORLAND INTERNATIONAL, INC.,  
*Defendant.*

---

DEPOSITION OF ROBERT HESTON DICKERSON, JR.

THURSDAY, SEPTEMBER 12, 1991

CONFIDENTIAL  
SUBJECT TO PROTECTIVE ORDER

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Reported by: Victoria Jensen, CSR# 6393

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\* \* \*

[4] Q. Would you please state your full name and address for the record.

A. Robert Heston Dickerson, Jr. I'm at 210 Carbonera Drive, Santa Cruz, California.

Q. And when were you born, sir?

A. January 17, 1957.

Q. By whom are you employed?

A. Borland International.

Q. What's your current position there?

A. I'm Vice President and General Manager of the Database Business Unit.

\* \* \*

[9] Q. And in fact, when you joined Borland was responsibility for spreadsheet products included in what you did?

A. The product management responsibility for spreadsheet was included.

\* \* \*

[15] Q. And how would you describe the change in your responsibilities at that point with respect to the product that became Quattro Pro?

[16] A. Before I managed someone else who took care of the product and focused strictly on the product management responsibilities. Afterwards, I took direct management responsibilities for the product, and did whatever needed doing, irrespective of the area in order to ship the product.

Q. At the time of this transition in early 1989 did you become more active in the development side?

A. Development? Describe "development side".

Q. Working more closely and more actively with people such as Mr. Warfield who are actually developing the product.

A. Yes, I did work closely with Bob Warfield.

\* \* \*

[62] Q. Mr. Dickerson, at any point prior to the release of Quattro Pro do you recall participating in any discussions concerning the legality of including the 1-2-3.MU file in the product?

A. None that I can recall, no.

Q. And do you recall ever participating in any discussions about whether or not Lotus was going to sue or object to the 1-2-3.MU file?

A. That seems like the same question. The answer is no.

Q. Now I believe you testified before that you didn't particularly have an opinion as to whether it was necessary to have the 1-2-3 macro compatibility in the product for it to be commercially successful. Whatever you precisely said before will speak for itself, but I do recognize that we talked that. I mean to ask a slightly different question. Do you recall whether you had any view at the time that Quattro Pro came out as to how important it was to have macro compatibility with 1-2-3?

A. Yes. I did feel it was important to have macro compatibility with 1-2-3. I'm not quite sure how to measure that, but I felt that was important.

[63] Q. Were there any particular audiences or target markets, if you will, for whom you thought that would be particularly important?

A. Yes.

Q. What were those?

A. Those who would be people that already had Lotus 1-2-3.

\* \* \*

[64] A. I think that any computer user is likely to be a Lotus 1-2-3 owner.

Q. Fair enough. I mean—

A. Lotus.

Q. What you're trying to tell me at that point you're not sure you would really distinguish that kind of customer as one that be more likely to be a 1-2-3 owner than anyone else.

A. If somebody has an 80 percent market share or thereabouts, it's hard to say. Anyone using a spreadsheet is likely to be a Lotus owner, irrespective if they're in a corporation or in a home.

Q. Do you recall whether up to the time that Quattro Pro came out, Quattro, the original version had been perceived as a successful product?

A. By me?

Q. Well, by you, I'll start with that and then ask if that was shared.

A. My sense was that the original Quattro was not as successful as we could be in the spreadsheet category.

Q. Did you have any views as to why that had been—

A. Yes. I felt that the product was buggy. It was not able to load very large spreadsheets, so if you were—if you had a copy of Lotus on the machine and a

\* \* \*

[94] promote it to make people want it. We call it a green crystal because it's like Tide, why does Tide get your clothes whiter? They have green crystals and if someone asks what's in those green crystals? So our green crystals was VROOMM, which stood for Virtual Run Time Object Oriented Memory Manager.

And the thing that VROOMM allowed us to do, was load very large spreadsheets into Quattro. And so we were promoting that you have all these new features and not to have to move up to a bigger machine in order to load your spreadsheets.

Q. Well, was part of the compatibility without cost message related to users potential need to learn a new product?

A. Well, in our marketing materials it was a part of it.

Q. How did that play out?

A. Well, the factor was we wanted to go out to people using competitors' products and say, here's Quattro. It's easy to switch to. And so we promoted everything that we could think of that would make Quattro easier for Lotus users to adopt, if we were selling to a Lotus audience.

Q. Well, such as?

A. The things that we focused on were spreadsheet and macro compatibility, capacity, keystrokes, and there's [95] one more. Let's see. Well, I guess that's all, file compatible, macro compatibility and keystrokes.

Q. What do you mean by keystrokes?

A. The keys that you press when you use the product.



Q. In other words, if you used the 1-2-3 menu tree file at least in Quattro Pro you could press the same keystrokes that you already knew from 1-2-3?

A. That's correct.

Q. Is that what you mean by keystroke compatibility?

A. Correct.

Q. Would that same concept have been described in the messages as ease of learning? Or well, as ease of learning?

A. That's certainly possible, yes.

Q. All right. Do you recall any of the marketing trying to get at the concept by discussing re-training costs?

A. It seems I do, yes. I think I do remember that.

Q. Well, let me back up one step whether or not, because what I don't want to do is ask you to try to remember in your mind what the particular words were used in any piece of literature, but do you recall whether part

IN THE UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS

CIVIL ACTION No. 90-11662-K

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LOTUS DEVELOPMENT CORPORATION

vs.

BORLAND INTERNATIONAL, INC.

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November 8, 1991

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Oral deposition of JAMES C. EMERY, held in the offices of Advocate Court Reporting Services, Inc., 12th Floor, 1525 Locust Street, Philadelphia, Pennsylvania, 19102, commencing at 10:00 a.m. on the above date before Linda Lubert, a Certified Reporter and a Notary Public in the Commonwealth of Pennsylvania.

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\* \* \*

[202] Q. What's more critical to the value of the software, the words that are coding for the functions or the functions themselves?

A. Well, before the learning is taking place and assuming a reasonable choice of words, then I would say the functionality.

But once a user associates a cluster of things or a specific function with a word, then it takes on additional value. It affects the market acceptability of the product.

But if you're saying—when you're first designing the menu, you have a huge scope of alternatives. So that there are out of the virtually infinite variety, there are a large number of structures that are perfectly adequate and it would be very difficult to say one is better than another.

Once you congeal the design and have successfully marketed it and spend the money [203] to get people to use it and they've trained on it, then the economics change.

You incurred a cost, both a marketing cost and a learning cost on the part of the users that change the economics.

Q. When that change occurs, does there ever come a time where the words chosen are more critical to the value of the software than the functions that they represent?

A. If you introduce the product where the functions are exactly the same, the menu structure was exactly the same, but all you did was arbitrarily make a choice of words, I think that would diminish the value of the product because users would then have to learn a new set of words.

In fact, it's conceivable that what they know before would have a negative effect, because now they have to unlearn what they knew and learn a new set of words.

Q. I'm going to move to strike. That is not what I asked you.

What I asked you, sir, was in this context that you're describing, whereas the product is released and the words chosen have [204] greater value or increasing value over time as users use them, my question is, does there ever come a time when the words chosen are more critical to the value of the software than the actual functions the software performs.

MR. KONRAD: I object. You move to strike. It's your right to do so. I think he tried to answer your question in the right

way. It's difficult to make comparisons except by complex reasoning. I think he was trying to answer your question before.

Do you understand the precise question?

THE WITNESS: No, I don't understand the question.

A. You're implying that as time moves on, the shifts in economics change and at some point something happens. I don't understand what you are saying.

As people learn—Let's say the market expands until more and more people learn the specific choice of words. It seems to me one could argue at some point—let's say the [205] functionality at the beginning was more important than the words, but relatively speaking, the words assume greater value as the population expands that knows it, and therefore, would be difficult to shift.

So that phenomenon can take place. I'm not sure if that's the phenomenon you're referring to.

Q. That's precisely the phenomenon I'm referring to.

Does there ever come a time where the words become more critical to the value of the software than the functions themselves?

MR. KONRAD: In all cases or can you posit a case?

BY MR. GREGORIAN:

Q. Can you posit a case where that would be true?

A. Sure. Particularly if the alternative is almost the same functionality. It's this complex trade-off that we've been talking about in several cases today.

\* \* \*

[209]

\* \* \*

Users have to weigh the enhanced functionality of the new product versus the learning. And the learning in part is learn-

ing new words. That's not all the learning but that would certainly be a part of it.

There could certainly well be a situation where new products do not offer sufficient enhanced functionality that a substantial number of users would be willing to switch.

So at that point you could say the value of the words exceed the value of the [210] functionality. The relative functionality.

You always have to compare things relative to alternatives.

\* \* \*

[236]

\* \* \*

Q. Doctor, you say in Paragraph 113 that whether alternatives could have been chosen at the beginning that would have done equally well is irrelevant, once users did learn the 1-2-3 menu commands, those particular commands acquired great significance. Their current value lies precisely in the familiarity that millions of 1-2-3 users have acquired with them; correct?

A. Correct.

Q. Is there anything that you believe has contributed to their current value besides this familiarity people have acquired over time?

MR. KONRAD: Is it fairer to say [237] that your question is when you said the current value line is precisely in the familiarity, does he mean it lies only in the familiarity?

MR. GREGORIAN: All right. That's a good way to put it.

MR. KONRAD: So he understands you. I don't know what the answer is.

A. No. It includes things like training material available, text books that are available, a population of trained people that you can hire to use this, a set/third party developed products that are compatible with your product.

There tends to be a whole structure that grows up around the successful product and we get a positive feedback mech-

anism, that the value of a product increases greater value, which in turn, further increases the value through all these ways.

And Lotus was in the fortunate position of having all those contributive values.

BY MR. GREGORIAN:

Q. But I'm not asking about and I don't think your speaking in Paragraph 113 about the value of [238] the product. You're talking about the value of the menus and the menu structure; correct?

MR. KONRAD: I'm not sure that the answer is different from the question.

MR. GREGORIAN: That's what I'm trying to ascertain.

MR. KONRAD: I think the question, Professor, is whether or not these things you are speaking of concerning training and support and all of that are part of what you see in the value of the menu structure?

MR. GREGORIAN: Correct.

A. Well, the reason a user would be unwilling to change is that they would have to learn a new product. If they jump to a new product, they wouldn't simply be foregoing whatever advantages of the old product and learning that they invested in it, but a whole set of auxiliary advantages of third products, trained user population, textbooks, et cetera.

So it's a major shift when you move to another product that isn't compatible with all of the infrastructure that has grown up around [239] a successful product.

I don't think you can divorce the issue of that menu from all these other things. They're part and parcel of the same thing. It's part of the hurdle of moving to a different product.



UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS

Volume I  
Pages 1 to 176  
Exhibits See Index

Civil Action  
No. 87-0076-K

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LOTUS DEVELOPMENT CORPORATION,  
*Plaintiff,*

vs.

PAPERBACK SOFTWARE INTERNATIONAL, et al.,  
*Defendants.*

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Civil Action  
No. 87-0074-K

LOTUS DEVELOPMENT CORPORATION,  
*Plaintiff,*

vs.

MOSAIC SOFTWARE, INC.,  
*Defendant.*

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THIS TRANSCRIPT IS DEEMED CONFIDENTIAL  
PURSUANT TO COURT ORDER

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DEPOSITION OF BERNARD A. GALLER, a witness called on behalf of Paperback Software International, taken pursuant to the Federal Rules of Civil Procedure, before Ralph J. Simpson and Robin Gross, Registered Professional Reporters and Notaries Public in and for the Commonwealth of Massachusetts, at the Offices of Sherin and Lodgen, 100 Summer Street, Boston, Massachusetts, on Thursday, January 25, 1990 commencing at 12:50 p.m.

\* \* \*

[116] Q. Did you receive any other written materials from Lotus?

A. I believe that's all.

Q. Did you receive any other written materials from Lotus' lawyers?

A. I will correct my statement. I believe everything I received came through the lawyers.

Q. Now, I see a reference here, Professor Galler, November 9, 1989, to review of outline. What is that outline, please?

A. That may have been an outline representing a draft of the first declaration.

Q. Who prepared that outline?

A. It was prepared at my direction, and after a number of conversations the first outline was prepared by counsel to reflect what I had told them. They very graciously offered to do the writing and the text processing to start with.

Q. Had you given them any written input prior to the preparation of that outline?

A. I believe I made available to them some of the testimony from the Digidyne/Data General case, [117] where I did largely a tutorial discussion on computers and computing, and operating systems and so on for that case. I believe I had made a copy of that available to them, along with a notebook with pictures of the visual aids I used in that tutorial in that case. I think that's all. Most of the input for that outline was our discussions.

Q. I show you two volumes, and I ask if this is the testimony to which you were referring.

(Pause)

A. Okay, I'd like to qualify or explain my previous answer.

Q. Please.

A. The answer to this is yes, I believe these are the transcripts of my trial testimony; one representing primarily my presentation as the tutorial, and the second day probably being almost entirely the cross-examination.

Now, what I said I made available to counsel here was not the transcript of this. Judge Orrick in that case required that all direct testimony be submitted to him in advance.

Q. In writing?

A. In writing.

[118] Q. Sounds familiar.

A. Therefore, my entire tutorial had been prepared in writing ahead of time. And I believe it was a copy of that submission, prepared ahead of time, that I made available to Mr. Beckerman. I think you will find, if there's a comparison of that document and the transcript, that it's very close. I followed it almost verbatim, but I won't—my style is not to read to the jury but to explain.

Q. So if I can just make sure, Professor Galler; I take it, then, that the volume I'm now holding is essentially your reading your prepared direct testimony, perhaps not word for word, and it was actually the written direct testimony which you had sent to your lawyers?

MR. BECKERMAN: I object to the word "reading."

A. I just said I didn't read it to them. I would say there's a close parallel because it reflected what I intended to say, and I had it in front of me, highlighted and so on to guide me in what I said, but it was close. I did not read it.

Now, further than that—let me see that again, because you say "this volume," and I don't [119] know if there's anything in here besides that.

MR. BECKERMAN: And let the record reflect the volume under discussion is the excerpted reporter's transcript of Tuesday, March 24, 1981, in Digidyne Corporation against Data General Corporation, et al.

Off the record.

(Discussion off the record)

Q. Professor Galler, I take it that the direct examination in the volumes which I handed you is substantially the same, although not identical, to the material that you just testified that you sent to Mr. Beckerman.

A. That was the intent, and I think it is. I note that in this first volume dated March 24, my tutorial discussion ended almost at the end, on Page 373, and I think cross started after that, so most of this volume is the tutorial.

\* \* \*

UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS  
Volume I  
Pages 1-176  
Exhibits 1-3  
  
CIVIL ACTION  
No. 90-11662-K

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LOTUS DEVELOPMENT CORPORATION,  
*Plaintiff,*

—vs.—

BORLAND INTERNATIONAL, INC.,  
*Defendant.*

---

SPECIALLY CONFIDENTIAL,  
SUBJECT TO PROTECTIVE ORDER

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CONFIDENTIAL DEPOSITION OF BERNARD A. GALLER,  
Ph.D., a witness called on behalf of the Defendant, taken pursuant to the Federal Rules of Civil Procedure, before Joan M. Kelley Cassidy, Registered Professional Reporter and Notary Public in and for the Commonwealth of Massachusetts, at the Offices of Hale and Dorr, 60 State Street, Boston, Massachusetts, on Wednesday, August 28, 1991, commencing at 1:00 p.m.

PRESENT:

O'Sullivan, Graev & Karabell  
(by Henry B. Gutman, Esq.)  
30 Rockefeller Plaza, New York, NY 10112,  
for the Plaintiff.

Fenwick & West  
(by Edmond C. Gregorian, Esq., and  
Stuart P. Meyer, Esq.)  
2 Palo Alto Square, Suite 800, Palo Alto,  
CA 94306, for the Defendant.

\* \* \*

[41] Q. Any other litigation expert engagements with Lotus besides the Paperback case, as we have defined it, and this case?

A. No.

Q. Any consulting relationship with Lotus past or present—

A. No.

Q. —other than in connection with these cases?

A. No.

Q. Any discussion with any representative of Lotus about possible future work in the litigation area or consulting area?

A. No.

Q. Nobody at Lotus has told you that there might be more work of this nature for you in the future—

A. No.

Q. —that's what you are testifying?

A. That's correct, the answer is no.

Q. Now, with regard to the litigation consulting that I have been asking you about, how much income did you derive from that type of [42] activity in 1990?

A. I believe somewhere in the area of \$50,000 to \$60,000.

Q. How about 1989?

A. Perhaps the same.

Q. 1988?



A. I don't know. I don't make any attempt to remember those figures.

Q. And if I broadened the question to all types of consulting, including non-litigation related, what would be your income from consulting activity in 1990?

A. About the same. Most of my consulting in the last few years has been of this nature.

Q. Okay. And would that answer apply to '89 and '88 too; that is, the non-litigation consulting would not add a great deal to the figures you have been already given?

MR. GUTMAN: Wasn't '88 the year for which he didn't remember?

MR. GREGORIAN: Yes.

Q. But whatever the figure is, the question is, did the non-litigation consulting add significantly to X?

[43] MR. GUTMAN: I'll object to the form, but you can answer it.

Q. It's a little metaphysical, I agree.

A. I understand. Part of the question is what is significant. But I mentioned that most of my consulting was of this kind. My relationship with NCR on the committee I mentioned is an example of some other work that I do. But most of my consulting is of the litigation kind in recent years.

Q. "Most" is a little unspecific too.

A. It's as good as your "significant."

Q. Okay, maybe better. Would consulting outside the litigation sphere have added more than 10 percent to the figure you gave me for 1990, which was \$50,000 to \$60,000?

A. No.

Q. Would it have added more than 10 percent to the figure you gave me for '89, which was \$50,000 to \$60,000?

A. I don't think so.

Q. What was your salary from the University of Michigan in 1990?

A. About \$98,000.

[44] Q. And how about 1989?

A. About \$94,000.

Q. Now, you had indicated in response to some questions that you were asked in the Paperback case, that you had not used the 1-2-3 product before being retained by Lotus in the Paperback case; is that correct?

A. I believe so.

Q. You had also indicated—and I believe you were asked this question during the trial—that up until the time you testified at trial, you had used that product for approximately three hours; is that accurate?

A. I believe that's right.

Q. Since the Paperback trial, have you had occasion to use Lotus 1-2-3 some more or not?

A. Except for the experiments we already discussed—

Q. Today's experiments?

A. Yes.

Q. Okay.

A. Except for those, no.

\* \* \*

[76] MR. GREGORIAN: Exhibit 2. (Document marked as Exhibit 2 for identification)

Q. Doctor, I am showing you Galler Exhibit 2 for identification. Can you identify that as a copy of your resume or curriculum vita?

A. (Witness reviews document) It is, as of some date. I believe in 1990.

Q. So it's current as of that date?

A. As of whatever date it was produced, yes. And it is fairly recent; but I have a more recent one, which I don't think is material here. I just want to be sure that it's understood this is—as of the date it was produced, this is correct.

Q. Now, calling your attention to the bibliography section which begins about three or four pages in—

A. Yes.

Q. —are there any publications since whatever date this was prepared?

A. Yes. I believe I have added one or two in for 1991.

Q. Do you recall what those are?

A. They are in the area of intelligent vehicle [77] highway systems. They are not relevant to this case.

Q. They have nothing to do with user interfaces or—

A. No.

Q. And where did those articles appear?

A. I think they're listed as technical reports at the University of Michigan.

Q. What does that mean, a technical report, in the context of the University of Michigan's business?

A. It means it's not an official refereed publication; it's a document which is distributed to people who might be interested in receiving it.

Q. Within the university community?

A. Well, and often to other universities or other interested parties.

Q. So these reports aren't published anywhere in any journal or—

MR. GUTMAN: I object to the form.

A. The reports represent an informal publication process that—the same content, sometimes even the same papers, are submitted for publication to formal journals; but this is an early [78] publication process. Some of them never do get published more formally.

Q. Have you submitted these papers for publication?

A. I don't think so.

Q. Do you have a co-author on these papers?

A. I think one of my students was a co-author on one or both of them.

Q. What was his or her name?

A. His name is Avi, A-v-i, Rubin, R-u-b-i-n.

\*Q. All right. Calling your attention to the publications on the first two pages of the CV that we do have in front of us, which I believe takes us back to 1978, are there any of those that deal with user interface design or computer/human interaction topics?

A. Would you repeat that, please.

\*(Question read)

MR. GUTMAN: I object to the form of the question.

A. Computer/human interaction is a very broad area. I mean, even these intelligent vehicle highway systems articles discuss computers in the car interacting with the driver, interacting with [79] central computers on the roadside; and those are computer/human interactions.

Q. Let me limit it, then, to user interface design. Are there any on the first two pages that deal with user interface design issues?

A. I don't think so.

Q. Are there any in the bibliography at all that deal with user interface design issues?

MR. GUTMAN: I object to the form.

A. On page 3 under 1973 there's a description—a paper listed which describes an interactive student registration system which reports the results of a student project which eventually developed into the student class registration system at our university.

Probably in that paper there's reference to the fact that we designed into the system a user interface for the operator of the terminal where the registration would be done. I don't think there is any real discussion of it. I think there is a mention of it.

Q. Okay. Any others that mention—that discuss user interface design besides the one you've identified?

[80] MR. GUTMAN: I object to the form.

A. I don't think so.

Q. Now, if I could call your attention back to the opening entries on the bibliography, there is, for example, in the first item, a parenthetical that says "with K. Chen." What does that mean, "with K. Chen"?

A. Well, Professor Kan, K-a-n, Chen was a co-author of that paper.

Q. Is Professor Chen the so-called first author of that paper?

A. I believe—



MR. GUTMAN: I object to the form.

A. I believe I was first author in the usual sense of one of those two, and he was the first author on the other.

Q. Okay. And "first author" in the usual sense means what?

A. Did most of the writing. In both cases, of course, the work was regarded as joint; but one of us did more of the actual writing of the paper.

Q. You believe that was you in one case and he in the other; is that correct?

A. Yes. I believe the first one would have [81] listed him as the first author, and the second one would have listed me.

Q. And in terms of the work that was done that led up to those papers, did he do most of the work, or did you do most of the work?

A. No. I think it was quite joint, quite equal.

Q. Equal division?

A. I think so.

Q. Equal as those things can be; is that right?

A. That's right.

Q. Is Chen a professor at Michigan?

A. Yes.

Q. Is he in the engineering department?

A. He is in my department, electrical engineering and computer science. He is in another division of the department.

Q. Now, there are some references here to what appear to be conferences or symposia. For example, the third item, "Thoughts on Software Engineering," refers to a conference on software engineering in Pittsburgh in 1989. Are those papers, or are those transcripts or summaries of remarks you made at the

[82] conference?

MR. GUTMAN: I object to the form.

A. Well, you are saying "those." Let me talk about that one—

Q. All right, talk about that one.

A. —because sometimes the circumstances are different for different ones. That particular one I was on a panel which was

discussing the progress of software engineering over the last 25 years; and each of us prepared a kind of position paper in advance, which was later published here, as indicated in this item.

Q. And this item indicates that you were—that your paper that you prepared in advance was one page?

A. One page.

Q. Now, the next item, "The History of the Computer, Part One. . .," *Humanities Education*—is that a publication—

A. Yes.

Q. —*Humanities Education*?

A. That's correct.

Q. And who is the audience for that publication, if you know?

[83] A. I believe scholars, primarily in the academic community in the humanities.

Q. And your contribution on this particular item was approximately five pages; is that right?

A. That's correct.

Q. Now, there is an entry under 1985 entitled, "An LSA Computer Environment." That's the title, I take it; is that correct?

A. That's correct.

Q. And then that's followed by, quote, LSA, the University of Michigan. Is that a reference to a publication?

A. Yes. There's a—I don't think it exists now, but at that time there was a magazine, a—something between a magazine and a newsletter put out by the College of Literature, Science, and the Arts for their alumni and faculty; and I wrote an article for them about the environment in the College of Literature, Science, and the Arts dealing with computers.

Q. I see, all right. 1986, the item that appeared in the IEEE International Conference on Systems, Man, and Cybernetics Proceedings—is that a paper that was prepared in advance, or is that [84] some sort of transcript or summary of remarks that you gave at the conference?

MR. GUTMAN: If you remember.

Q. If you remember.



A. I don't really recall too well. That arose out of a seminar that I headed—that I organized and chaired in Japan in 1985, and I believe I prepared a short report about that seminar and gave it at this international conference in Georgia. And, again, it was about a one-page summary about what had happened in Japan the previous year.

Q. I see. Is this bibliography for the period 1985 to the present and the two publications that you referred to from 1981 on here—is it complete?

MR. GUTMAN: I object to the form.

A. It's complete—I believe so.

Q. And your updated resume that you referred to—would that have the two '91 publications listed?

A. Yes. I think I have a copy of that in my briefcase, and I can give that to you tomorrow.

\* \* \*

[89] Q. The courses this year, Computer Science 280—is that a semester course or a full-year course?

A. Semester course.

Q. And the IVHS course—is that a single semester or full year?

A. The lecture is one semester. We will have a laboratory part the second semester, so . . .

Q. Are you participating in both?

A. I'm—I have been participating—well, I mentioned my participation in the lecture part.

Q. Yes.

A. In the laboratory part—I have been supervising the organization of it. I won't actually teach it.

Q. Okay. And taking the period prior to 1989, the last advanced course—strike that. Let me ask you a better way. In 1988 what was your teaching—

A. That year was also the 181 course.

Q. The last advanced course, advanced computer course, that you taught at Michigan was in 1987; is [90] that correct?

A. I believe that's right.

Q. And the last intermediate course that you taught was in 1984; is that correct?

A. I believe that's correct.

Q. You have never—as I understand it at least, and correct me if I am wrong—you have never taught a course on user interface design; is that correct?

A. That's correct.

Q. In your own courses, you would spend perhaps an hour, but no more, on user interface design issues; is that accurate?

MR. GUTMAN: I object to the form.

A. I can't answer that because I don't usually segregate out such issues and identify them as such. In all of my teaching I mention, when appropriate, issues of design. And, for one thing, when I talk about design, that includes interface design. I do spend some time on design questions.

Q. Well, design questions aren't limited to user interface design questions, are they?

A. Not limited to, but they would cover them too.

\* \* \*

[95] A. I have heard recently that there is some work in the psychology department. I don't know about courses, and I don't know specifically who does it.

Q. The human factors course—is that in your department?

A. No, it's industrial and operations engineering, No. 436.

Q. Is its subject matter limited to computers, or does it go beyond to other types of man/machine interactions, if you know?

A. I believe it's limited to computer type interactions.

Q. Do you know Professor Green?

A. Yes.

Q. Do you have professional contact with him?

A. Yes.

Q. Any knowledge or information concerning his competence in the field of human factors?

A. I believe he is recognized as quite competent.

Q. I'd like to ask you some questions about your involvement in software design. And because of the length of your career, I think we, for the sake [96] of efficiency, ought to limit it to the last ten years. Is it correct that in the last ten years the only applications software whose design you have been involved in is this project that you undertook with your son?

MR. GUTMAN: I object to the form.

A. Well, for one thing we haven't introduced the project that I did with my son. Are we supposed to all understand what that is?

Q. Well, I am going to ask you some questions about that; but I'm trying—you were asked about that—

A. We will agree that there was a project with my son.

MR. GUTMAN: He has the Paperback transcript, so. . .

Q. I don't want to reinvent the wheel here. I have read the transcript.

A. I understand, but I am not used to no foundation questions. But I will accept it.

MR. GREGORIAN: I can't ask him legal questions? He's objecting on foundation grounds.

\* \* \*

[101] A. Yes, a product resulted. Unfortunately, I have not been able to convince everybody at the university who is involved to use it. I lament that because I think they're foolish. They are continuing to use a very primitive input method for the product—that the product they bought requires, and it's going to cost the university a great deal to continue to do it that way.

Q. Is the product that resulted from your student work called something? Does it have a name?

A. It was called CEDARS, C-E-D-A-R-S.

Q. Is that an acronym?

A. Yes. The product the university bought was DARS, D-A-R-S, where the "A" is "Audit"; but I don't remember the

rest of it. But the "C E" we put on the front is probably "Computer Environment" or something.

Q. Let's talk about the CEDARS program. That has not been placed in service at the present time, correct?

A. No. It was demonstrated. It worked. It has not been adopted.

Q. Technically speaking, is the CEDARS program [102] which you've described an applications program or a systems program?

MR. GUTMAN: I object to the form.

A. That question sometimes comes up. Is a FORTRAN translator part of an operating system? I generally include it. Other people sometimes don't. I think this would be in the same nature of that question.

Q. I.e., it's borderline?

MR. GUTMAN: I object to the form.

A. It's borderline. In my opinion it's part of an operating environment; but, I mean, I'd be just as happy, in the context of whatever the discussion is, to call it an applications program if that's useful.

Q. With regard to the other item you mentioned, small programs for your own use, can you give me an example of what you are talking about there?

A. Oh, programs for computer grades, programs for keeping track of resources, whatever.

Q. Now, with regard to—when you say, "Keeping track of resources," you mean like personal financial applications?

[103] A. That kind of thing and related things, yes.

Q. Did the CEDARS program have a user interface?

A. Yes.

Q. What was the nature of that? Was it menu based or command driven?

A. I guess I don't recall.

Q. Was the user interface for that program specified in your student assignment, or was it something the students designed?



A. The students designed, which is why I don't recall because I didn't specify it.

Q. The program—and, again, I just—if you recall a name, it would help in framing the questions. The program that you did with your son—did that have a name, either commercial name or acronym?

A. CORP, C-O-R-P.

Q. CORP, C-O-R-P?

A. Right. It was an acronym, but I don't remember now what it was an acronym for.

Q. Did the CORP program have a user interface?

A. Yes.

Q. What was the nature of it?

[104] A. It was demand driven.

Q. And who did the design work on that?

A. My son and I.

Q. Together?

A. Together.

Q. Equal division of effort on that or—

A. I think so. I remember now that it was run on a TRS 80 Model I, which puts it approximately in 1980, 1981.

Q. Do you recall how many different commands there were?

A. I don't recall. I think there was a fair amount of prompting from the system once a command was given. I don't think there were too many commands.

Q. More than ten?

A. Maybe about ten.

Q. Who designed the prompts?

A. I think we did most of the design equally.

Q. How long did the total project take?

A. I don't recall, a number of months. I mean, we were both part-time people.

\* \* \*

[117] Q. Are there any texts or treatises in the field of user interface design that you regard as authoritative?

A. I don't know of any.

Q. Do you know of any texts, whether—or treatises, whether you regard them as authoritative or not?

A. I am sure there are some. I think there are some well known works by Ben Schneiderman. I think he has a book or maybe even more than one, but I have not used them. I have not read them.

Q. Have you read any texts or treatises in the field of user interface design?

A. No.

Q. Have you read any articles on user interface design?

A. I don't recall.

Q. Are there any articles on user interface design that you know about that are regarded in the field as authoritative?

A. Again, I have seen references to some. I may even have read one or two, now that I think of it, by Schneiderman; but I don't recall specifics.

\* \* \*

[123] Q. Are you aware of the SIGCHI special interest group within that organization?

A. I am aware of it, yes.

Q. What is it, sir?

A. Special Interest Group on Computer/Human Interaction, I believe.

Q. Are you a member of that group?

A. No.

Q. Have you ever been a member of that group?

A. No, it didn't exist when I was president.

Q. Have you ever attended conferences sponsored by that group?

A. No.

MR. GUTMAN: Well, I'll object to the form. I think it's potentially misleading. Don't they hold joint conferences with the ACM?

MR. GREGORIAN: Look—

THE WITNESS: No. He said conference sponsored by them, and I haven't been.



MR. GUTMAN: Okay. Just to be fair, they sponsor some conferences jointly with the ACM. Do you mean to exclude those or not?

MR. GREGORIAN: Come on, you are putting questions to him now. If you want to cross-examine [124] him, that's fine.

THE WITNESS: I don't think I have been at any conferences in which they have been a sponsor.

Q. Have you been at any conferences at which they have been a joint sponsor with the ACM?

A. No.

Q. Okay.

A. That's what I meant.

Q. Have you ever read published conferences—conference proceedings of SIGCHI?

A. No.

Q. Are you a member of any other professional group or association or organization whose focus is user interface design?

MR. GUTMAN: Object to the form, lack of foundation.

A. I am not a member of any group which advertises its focus, whatever that means, on user interface design.

Q. Same question for computer/human interaction. Are you a member of any such organization or group?

MR. GUTMAN: Same objection.

A. No.

[125] Q. And just so we don't have a problem at some later time about what I mean by "focus," I mean a group whose primary interest or objective or raison d'être is user interface design, as opposed to the multitude of other areas that I am sure are equally interesting in the computer field. That's what I mean.

MR. GUTMAN: I object to the form.

Q. Is your answer the same?

MR. GUTMAN: I object to the form of the question. You mean the same as the answer about not belonging to groups that advertise themselves that way?

MR. GREGORIAN: Correct.

A. Yes.

Q. You refer in your affidavit in this case to having conducted a review of Quattro and Quattro Pro in connection with your work on this matter. Can you describe for me physically what you did to review those products?

A. Well, it included this morning's work on the machine; but I—

Q. Well, you have described that in some detail. Let's set that aside. Let's say [126] preparatory to your declaration, you looked at the products, right?

A. I looked at the manuals—well, Quattro, I looked at the product. Quattro Pro I did not see the product and interact with it. I read the manuals.

Q. Okay, fine. I am glad I asked. With regard to Quattro, let's talk about your review of the product. You had it up on the computer and running, correct?

A. Yes.

Q. What physically did you do?

A. I am not sure I know what the question is.

Q. Well, your affidavit says that you reviewed it. I don't know if that means you looked at the opening screen, you worked through the menu hierarchy, you balanced your checkbook, you created a spreadsheet and made changes to it. I am just trying to understand in a general way what this review consisted of. That's all. It's not a trick question, I assure you—

MR. GUTMAN: Please.

Q. —as opposed to something else.

MR. GUTMAN: Oh, come on. I will object to [127] the form of the question.

MR. GREGORIAN: Okay.

MR. GUTMAN: Not to mention the incredible —

Q. Okay. It is a trick question. Answer it anyway. I just want to know what you did.

A. I installed it.

MR. GUTMAN: I object to the form of the question. Tell him what you did.

A. I installed the product during the period when I was installing several other products over the course of several weeks. In each case I exercised it to some extent. In some cases—and I don't remember if Quattro was one of them—I actually went through the tutorial that came with it. In others, I tried various combinations of things that one usually does with spreadsheets, in some cases created a back road to see how one did it and how one would invoke the macros and what was involved in working with the system.

I don't recall specifically how many of those various activities I did with any one of the products, such as Quattro.

Q. When did you do this activity?

[128] A. In preparation for the Paperback case.

Q. Oh, in the Paperback case?

A. Right.

Q. Since—when —

A. Oh, I'm sorry. I did bring that up again. I mean, I did bring up the screen and try a few things to refresh my memory for Quattro—oh, I'm sorry. I installed Quattro Pro—after the Paperback case?

MR. GUTMAN: Yes, the time frame is confusing.

A. Yes, I was thinking wrong. Before the declaration?

Q. Yes. That's what I am asking.

A. I'm sorry. I installed Quattro Pro as well, and I did the same kind of exercising on that. I just was thinking incorrectly.

Q. All right. Let's back up a step.

MR. GUTMAN: Let's clarify.

THE WITNESS: Yes.

MR. GUTMAN: What he was referring to before is what he did in the Paperback case.

A. That's right. I think I was thinking for that case.

[129] MR. GREGORIAN: I have this proprietary instinct that I like to ask the questions.

Q. Is what you were referring to before with regard to Quattro work that you did in the Paperback case?

A. Yes.

Q. All right. Now, between the time you did that and the signing of your declaration in this case—

A. Yes.

Q. —did you do anything else by way of running, looking at, exercising Quattro?

A. Yes.

Q. What did you do with Quattro? And I will get to Quattro Pro, but tell me Quattro first.

A. Yes. Because of the issues in this case, I brought it up again on the screen. I went through the exercise of going from one menu structure to the other, back again, and tried a few simple things. I I didn't feel I needed to do very much because I was familiar with it.

Then I installed Quattro Pro—

\* \* \*

UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS

Volume II  
Pages 2-1 to 2-248  
Exhibits 4-11

CIVIL ACTION  
No. 90-11662-K

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LOTUS DEVELOPMENT CORPORATION,

*Plaintiff,*

—vs.—

BORLAND INTERNATIONAL, INC.,

*Defendant.*

---

SPECIALLY CONFIDENTIAL,  
SUBJECT TO PROTECTIVE ORDER

---

CONTINUED CONFIDENTIAL DEPOSITION OF BERNARD A. GALLER, Ph.D., a witness called on behalf of the Defendant, taken pursuant to the Federal Rules of Civil Procedure, before Joan M. Kelley Cassidy, Registered Professional Reporter and Notary Public in and for the Commonwealth of Massachusetts, at the Offices of Hale and Dorr, 60 State Street, Boston, Massachusetts, on Thursday, August 29, 1991, commencing at 10:00 a.m.

PRESENT:

O'Sullivan, Graev & Karabell  
(by Henry B. Gutman, Esq.)  
30 Rockefeller Plaza, New York, NY 10112,  
for the Plaintiff.

Fenwick & West  
(by Edmond C. Gregorian, Esq., and  
Stuart Meyer, Esq.)  
2 Palo Alto Square, Suite 800, Palo Alto,  
CA 94306, for the Defendant.

\* \* \*

[2-131] Q. Simple.

A. That doesn't mean anything to me. In the network example—once it's specified and standardized, you might describe it in one page, and it might look very simple; but it might have taken years to get there. So I'm sorry. I can't respond in that way.

\*Q. Within applications software, is there any generalization that can be made concerning the percentage of time—the percentage of total design time that would be spent on user interface design?

MR. GUTMAN: Object to the form.

A. Are you assuming in the words "applications software" that there will be a human interacting with a presentation on a screen?

Q. Yes.

MR. GUTMAN: And you are speaking in terms of time, not effort measured qualitatively?

MR. GREGORIAN: Just quantitatively.

A. Okay. Could I have the question read back.

\*(Question read)

A. I find it hard to make a generalization.



\* \* \*

[2-183] (Document marked as Exhibit 11 for identification)

Q. Doctor, I'm showing you an excerpt from Brooks' book, *The Mythical Man-Month, Essays on Software Engineering*, which I've marked as Exhibit 11. Take a look at page 20, sir.

A. (Witness reviews document) Yes.

Q. Do you see the paragraph that begins, quote, For some years?

[2-184] A. Yes.

Q. Does that paragraph refresh your recollection in any way as to whether Mr. Brooks' work is the source of your rule of thumb that's described in your affidavit?

MR. GUTMAN: Object to the form. I don't believe you've asked him whether it was the source. You've asked him whether it was consistent.

MR. GREGORIAN: I am now asking him whether it's the source.

A. All right. So you are not asking me whether it refreshes my memory or helps me recollect; you are asking me, was it the source?

Q. Yes, sir.

A. I can't say it was the source. I'm delighted to see it. I haven't looked at this book for many years, and I'm delighted to see that I am consistent with it. Whether it was a source or not, I don't know.

\* \* \*

[2-233] Q. Now, are you aware, Doctor, of any rules or criteria for user interface design?

MR. GUTMAN: Object to the form. What do you mean, rules or criteria?

MR. GREGORIAN: Design rules, design principles, design criteria that are applied by people, practitioners, in designing user interfaces.

A. Okay. Now that you have expanded the question, could I have—would you restate it as a single question.

Q. Are you aware of any design rules, principles, or criteria that are applied by practitioners in the field of user interface design?

MR. GUTMAN: I object to the form.

A. There are some common sense rules about ease of use and so on. I don't know of any specific rules that are applied.

Q. What do you mean by "common sense rules about ease of use"?

A. Such as it—the product ought to be easy to use.

Q. Anything more specific than that?

A. No.

[2-234] MR. GUTMAN: I object to the form.

Q. How about with regard to menu structure, organization, and design—strike that. How about menu design—are there any rules, principles, or criteria for good menu design that you are aware of?

MR. GUTMAN: Object to the form.

A. I would expect that there would be such rules for the people who are directly involved in those activities. I am not aware of them.

Q. Are you aware of any literature that discusses rules or design criteria for user interface design?

MR. GUTMAN: I'll object to the form of the question. He identified yesterday, I believe, literature he was aware of or some literature he was aware of concerning user interface design.

MR. GREGORIAN: Generally, that's correct.

MR. GUTMAN: But that's what makes this question confusing. Are you asking whether he remembers whether those books include a reference to rules?

MR. GREGORIAN: No.

Q. Other than what you mentioned yesterday, are you aware of any literature on user interface [2-235] design principles and criteria?

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MR. GUTMAN: I object to the form.

A. No. I told you yesterday what I remembered.

Q. Calling your attention to Paragraph 51 of your declaration, it states, quote, Within software specification and design, expression of the user interface is probably the most critical task the application developer faces and that in which the most significant creativity—creative activity and effort is expended, closed quote.

Now, in that statement you refer to application developer. Are you limiting that to application software development?

MR. GUTMAN: I object to the form. You can answer.

A. I don't think the intent was to limit it. I believe it was put in there because that was the context of the discussion.

Q. So you would believe that the statement has more general applicability than just applications software; is that correct?

MR. GUTMAN: I object to the form.

A. I think it has more general applicability

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UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS

Volume III  
Pages 3-1 to 3-257  
Exhibits 12-13

CIVIL ACTION  
No. 90-11662-K

---

LOTUS DEVELOPMENT CORPORATION,

*Plaintiff,*

—vs.—

BORLAND INTERNATIONAL, INC.,

*Defendant.*

---

SPECIALLY CONFIDENTIAL

---

CONTINUED CONFIDENTIAL DEPOSITION OF BERNARD A. GALLER, a witness called on behalf of the Defendant, taken pursuant to the Federal Rules of Civil Procedure, before Anne H. Bohan, Registered Professional Reporter and Notary Public in and for the Commonwealth of Massachusetts, at the Offices of Hale and Dorr, 60 State Street, Boston, Massachusetts, on Friday, August 30, 1991, commencing at 8:55 a.m.

PRESENT:

O'Sullivan, Graev & Karabell  
(by Henry B. Gutman, Esq.)  
30 Rockefeller Plaza, New York, NY 10112,  
for the Plaintiff.

Fenwick & West  
(by Edmond C. Gregorian, Esq., and  
Stuart P. Meyer, Esq.)  
2 Palo Alto Square, Suite 800, Palo Alto,  
CA 94306, for the Defendant.

\* \* \*

[3-80] Q. By the person who developed the product. In other words, is it typical to test a user interface design at some point prior to product release with human beings?

\* \* \*

[3-81] Q. I meant as a discrete test.

A. Specifically for that purpose?

Q. Yes.

MR. GUTMAN: Object to the form.

MR. GUTMAN: A. You did say by a person who is a developer, I think, and of course in an organization the testing may very well not be done by a person.

Q. All right, the company or whatever that is involved in the product.

A. Yes. I believe it is typical to ask people to interact with the product so as to ascertain the effectiveness of the user interface.

Q. So that would be testing where people are invited to use the product and then comment in some way on the user interface?

\* \* \*

A. That depends on the experimental design. I don't know how it might be done, that might be one way.

Q. Do you know what is done or the range of [3-82] things that are done in that type of testing?

\* \* \*

A. No.

Q. Do you know what manner or means are used to obtain feedback from people who—

A. Well, in answer to your previous question—

\* \* \*

A. —when I said I did not know, I had in mind within industrial companies; I mean, I have been involved in situations where I have done testing on software that I have done, and I know what I did to test it, but I answered your question in the context of typical industrial internal processing.

\* \* \*



\* \* \*

IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF MASSACHUSETTS

PAGES 1-179  
EXHIBITS 1-5

Civil Action No. 90-11662-K

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LOTUS DEVELOPMENT CORPORATION,  
*Plaintiff,*

v.

BORLAND INTERNATIONAL, INC.,  
*Defendant.*

---

Rule 30(b)(6) Deposition of  
Lotus Development Corporation by its designee  
Ezra Gottheil, Ph.D.  
September 22, 1992  
Boston, Massachusetts

---

PRESENT:

Kerry L. Konrad, Esq.  
O'Sullivan Graev & Karabell  
30 Rockefeller Plaza  
New York, New York 10112  
for Lotus Development Corporation

Peter E. Gelhaar, Esq.  
Donnelly Conroy & Gelhaar  
176 Federal Street  
Boston, Massachusetts 02110

—and—

Peter N. Detkin, Esq.  
Wilson Sonsini Goodrich & Rosati  
Two Palo Alto Square  
Palo Alto, California 94306  
for Borland International, Inc.

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Ezra Gottheil, Ph. D.

\* \* \*

[3] Q. Mr. Gottheil, could you state your full name for the record, please?

A. Ezra Lee Gottheil.

Q. Do you reside in or around Boston?

A. Winchester. It's about eight miles north.

Q. Could you give me your address, please.

A. 4 LaGrange Street.

Q. And you are employed by Lotus?

A. Yes, I am.

Q. What is your job title?

A. I'm a senior product design manager.

Q. And in that job title what do you do, basically?

A. My job is to coordinate the selection and design of features in our products, what features go in, how they're implemented, what the user interface looks like.

Q. How long have you had that job?

A. In its current position I've had it since February of '89 on different products, and then I was previously a designer for a period of time back in '85.

\* \* \*

[4] Q. When did you first start at Lotus?

A. July of 1981.

\* \* \*

Q. Can you somewhat stream of consciousness go from the time you first started with Lotus, with the company that you've just corrected me and was not Lotus, but could you tell me what your jobs were, when you had them, and the job descriptions?

[5] MR. KONRAD: I think that by "stream of consciousness" Mr. Gelhaar is asking you to give some sort of narrative. Typically that's not what we do, but I think he is just trying to save time. So if you can work through that chronologically, go ahead. But if you have problems doing that, Mr. Gelhaar can break it down, if necessary.

A. I'll give it a try. By the way, I was working part-time three days a week for the first year and a half and then four days a week for about another year until I became full-time.

Q. Let me break it down right now then. What were you doing when you were not working with Mr. Kapor?

A. I was working as a psychologist at Human Resources Institute in Lowell, Massachusetts, and I was working on my dissertation.

Q. So essentially you would work on that two days and you'd work with Mr. Kapor three days?

A. Right.

Q. Sorry for interrupting you. Why don't you continue, please.

A. Quite okay.

So my first job, which had no title [6] because it was a company of four people, was designer and programmer of a project that I proposed and set forth to implement.

Q. What product was that?

A. I called it IMP, the idea manipulator. That was one of its many names. It never saw the light of day.

After about a year, somewhere in early summer of '82, I requested that I work on 1-2-3, what was to become 1-2-3. It was then code-named Trio, I believe.

Q. Incidentally, was IMP a spreadsheet product?

A. No, it was a hypertext product.

Q. What is a hypertext product?

A. Hypertext is a system by which text is linked to other text and you can move from one piece of text to another along these links.

Q. Why did IMP not see the light of day, as you say?

A. It was at my suggestion that I stop working on IMP and start working on 1-2-3. There were two reasons for that. First of all, it became apparent to me that the company was and needed to be [7] focused on what was to become 1-2-3, and the other was that there were people around with far superior programming skills to my own and I was better off doing something else.

Q. I believe you told me we are at early summer of 1982 when you began working on what you referred to as the product Trio, which was the code name for 1-2-3.

A. Mm-hmm. At times it had other code names, but that probably is what it was at that point.

\* \* \*

[127] Q. What was your involvement, if any, in the development of the menu command hierarchy of version 1.0?

A. I made some suggestions. As a documenter and a member of the team, I was free to make suggestions about how I thought things might be made [128] better, both verbally and in writing.

Q. Did you have any decision-making capacity, in other words final decision-making capacity, concerning the development of the menu command hierarchy of version 1.0?

A. No.

Q. Are you familiar with the process by which the version 1.0 1-2-3 command hierarchy was decided?

A. I am aware of some of the considerations that went into it and I believe I understand what the various people did, but I was not present when these decisions were made.

Q. Could you tell me the considerations that you're familiar with?



A. I'm familiar with the wish to group commands logically. I am familiar with the wish to make commonly used commands be near the top of the menu, to put them at the left edge of any menu where they are—The more common, the farther toward the left they should be; that the words that are used should as clearly as possible communicate what the command will do; that the first letters of all the commands at any given menu be different; and that ideally no more than seven commands be in any menu.

[129] Q. Any others?

A. With respect to the choice of words, not only should they be clear but they should be as untechnical as possible.

Q. Any others?

A. An aesthetic judgment comes into play; simply a sense of words being right, feeling right, sounding right.

Q. Can you elaborate on that one for me, please? What do you mean by that, the aesthetic considerations of a word?

A. I don't think I can go much beyond it. When one chooses words, one chooses them for every purpose for their sound, for their pronunciation, for their resonances and reminders. One might, for instance, use the word "kill" to describe a removal or deletion, but it is an ugly word with negative associations.

Q. Would an example of an aesthetic quality of a word or in terms of choosing command words be that words should or should not rhyme?

A. Possibly. I've never heard of that being an issue, but it actually makes some sense.

Q. Would another example be that command [130] words not be alliterative next to each other?

A. In what sense?

Q. That they sound too similar.

A. Again, a worthy consideration that might come up under review or inspection but not one I've ever heard explicitly announced.

\* \* \*

[131] Q. Was screen size a functional constraint with respect to menu commands?

A. I'm not sure what you mean by functional constraint. There was a limited screen size that was set by the machine we were running on, which had 80 characters by 25 lines.

Q. And the fact that the first line only had 80 characters or each line, actually, only had 80 characters, how did that constrain the choice of menu commands?

A. Clearly, no menu could be longer than 80 characters. In fact, because we wanted to keep them shorter than seven commands, we had other constraints that were more powerful.

\* \* \*

[132] Q. Incidentally, was the menu command hierarchy reordered shortly before the release of version 1.0?

A. I do not know at what phases in the development of the product reorderings occurred. I do know that periodically things got changed and we would work with a given ordering and hierarchy for a while until certain objections surfaced, and then change them, and I don't remember any particular last-minute or toward-the-end kind of reorganization. One of the constraints on how much one can do that is the documentation must be finished before the software, so that it can be printed. So at a certain point everything that's described in documentation is set.

Q. Do you recall how many times the order of the commands was changed during that process in the [133] summer of '82?

A. No. I don't.

Q. If you had to guess, what would be your best guess?

A. My best guess is that there were very few complete rearrangements, but there were many modifications to one or two commands at a time. But I really have no idea of the number. Small changes were being made relatively frequently. Large changes were less frequent.

Q. So, in other words, more tinkering than large wholesale changes of the menu commands?



A. That would be my recollection.

Q. You testified earlier that it was a wish to group the commands in a logical fashion. Is that fair to say?

A. Yes.

Q. Could you explain what you mean by that?

A. In a hierarchical menu what exactly are the commands is not apparent when the user is at the top level. There are a series of operations that can be performed, but you don't have an exhaustive list before you. Therefore, what you try to do is put them in a category where the user is most likely to [134] find them if he or she looks for them there.

So what you want is a clustering of commands that either do similar things or operate on similar objects so that they can be described by one word, and in most cases the user will be able to infer, if they want one of those commands, to look under that word.

Q. Do you recall any specific discussions with anybody during the summer of 1982 and up until the release of 1.0 where this desire to have commands flow logically was discussed?

A. I remember only one discussion about specific menu issues and it had to do with putting move and copy underneath the range command. That would have given us more room at the top level and put them in a place they would be logical. But the constraint that said they should be as close to the top as possible conflicted with the constraint that said they should be grouped together.

\* \* \*

[135] Q. Can you give me a concrete example of the menu commands being grouped in a logical fashion so I can focus in on your point here?

A. Among the most obvious is file, where retrieve and save and combine and extract and directory are all put in one place. It makes complete sense to the user that anything having to do with a file is done there.

Q. And as a person who was developing the menu commands, you wouldn't want to do anything that didn't make sense to the user. Correct?

A. Right.

Q. So from that standpoint it is fair to say that the person or persons who developed the menu commands were constrained to do so in a logical [136] manner. Correct?

A. There were constraints like that, but there was enormous freedom of choice as demonstrated by the constant discussion and changing and also demonstrated by products that do the same thing but yet have different menu structures.

Q. It is fair to say, though, that there was no freedom of choice to be illogical?

A. There was no freedom of choice to be completely—Well, there was no freedom of choice to be completely illogical if a logical choice were available. In some cases no logical choices were available and you were making the best of a bad situation.

Q. And making the best of a bad situation was always picking the most logical of potentially illogical choices. Correct?

A. With the other constraints all in operation as well.

Q. You mentioned that you wished to make commonly used commands appear at the top.

A. Yes.

Q. Can you explain what you mean by that for me?

[137] A. In a menu there is the first level of commands, those that are chosen after the command prefix, in our case a slash key. We call that the top level. We want the most frequent things to be there.

Q. How did you arrive at that conclusion, that that should be the way it should be ordered?

A. I did not do this. I believe the way it was done was the introspective method. That is to say, the people who were designing the product used the product a great deal and noticed what they did. We also received some feedback from talking to users outside the company and we would ask—I presume we would ask them what they did most often.

\* \* \*

[143] Q. Dr. Gottheil, you mentioned in connection with the consideration we were most recently speaking about concerning most commonly used words being placed at the top of the line that more familiar commands should be placed at the left edge of that line. Did I get that correct?

A. I think it's more commonly used commands that should be placed at the left edge. The assumption is that the eye scans from left to right and the sooner one finds what one is looking for, the happier one is.

Q. Do you recall hearing any discussions among the Trio team concerning that consideration?

A. No, not specifically.

Q. Generally?

A. I don't recall specific discussions. It is my impression that that was one of the guidelines, and I don't remember exactly how I gained that impression, but I'm fairly sure it was a common consideration.

Q. Would one example of that constraint be the word "worksheet" appearing in the far left?

\* \* \*

[145] A. Frankly, I don't know why "worksheet" appears in the far left. My guess would be that it is used less often than some other commands.

Q. What command would you have rather seen appear on the first command to the far left?

A. It's a guess that it is less frequently used. There might be other reasons to leave it there. For instance, it may be that you want the user to see the list of choices, which in the case of [146] worksheet are a kind of odd assortment of things that are available under that command. When the cursor first starts up, that command is highlighted and that prompt is displayed. But in terms purely of frequency of use, my guess is either copy, move, or range would be used more often.

Q. Can you give me an example, if they're different than the ones you just gave me, of having a more familiar command appear on the far left?

MR. KONRAD: Objection. Again you said "more familiar." Do you mean "more commonly used"?

\* \* \*

[147] Q. Did you use the word "familiar" or "more commonly used"?

A. If at any point I used the word "familiar" in this context, I meant "more commonly used." If indeed commands were familiar, we would not have to go to pains to make them more obvious.

Q. Then would you give me an example of a more commonly used term which it was decided should appear on the far left-hand side of the screen?

[148] A. I don't know.

Q. And the reason that you don't know is because you were not involved in that portion of the process of the development of the command hierarchy. Is that correct?

A. There are two reasons. The first is that I was not involved. Secondly, that there are a number of considerations as to what goes where, and that unidimensionally singling out frequency of usage or shallowness in the menu or any of another bunch would suggest that one can generate an interface from rules. One cannot.

Q. Why not?

A. I misspoke myself. One can generate an interface from rules. It would be a bad interface. One cannot generate a good interface from rules. The point of this is that it is an artistic creation of one or a group of dedicated professionals to make a good, usable interface.

Q. And those principles of expression, as you say, are certainly constrained by certain logical ways of performing this task. Correct?

\* \* \*



[149] A. Are there things one cannot do in designing an interface, or one should not do? Yes. One shouldn't use a word that is completely irrelevant to the command. There are a thousand other things that one should not do. The space of bad choices for an interface is vast. The space for good choices is quite large as well.

Q. What you just said, the thousand other things that one should not do, it is fair to say, is it not, that those are constraints on a developer of a menu command hierarchy. Is that correct?

\* \* \*

[151] Q. I will agree with Mr. Konrad that if you cannot answer that with a yes or no, then you need not. If you can answer it yes or no, I would like you to do so.

A. I have become quite sensitive to what you mean by a constraint. Let me say what I believe to be the case.

There are many choices one can make which would make the interface bad: word choices.

\* \* \*

[152] Q. Dr. Gottheil, another rule or guideline which I will— Is it fair for me to say rule or guideline in the conversation we have been having as opposed to constraint? I mean, would that speed things along?

[153] A. Guideline would be preferable to rule.

Q. Fine. Concerning the guidelines that you initially discussed, I believe you said that the words should communicate intelligently what the command will do or something to that effect. Is that fair to say?

A. I'm sure I didn't use the word "intelligently." The meaning I was trying to communicate is that the new user would have the best possible chance of determining what the command will do from its name.

Q. Tell me why "global" is intuitive then.

A. In fact, I don't believe "global" is intuitive. It may very well be the least unintuitive of the choices, given the other

guidelines and your attempts to balance everything. "Global" has meaning. It means affects everything. But in many cases it would not become apparent to users what one might affect having to do with everything, certainly not from the word.

Q. Do you recall any specific discussions concerning the choice of the term "global"?

A. No, I don't.

Q. Do you recall any discussions concerning [154] the guideline of choosing words so that they will communicate to the initial users what the command will do?

\* \* \*

A. This would be a case where we change the name of a command, and I am sure we did, but I don't remember any specifics. I can say that there are differences, for instance, between the wording in Symphony and 1-2-3 where my guess is we thought we had an opportunity to use a more clear word, "erase" versus "delete." Then there is "exit" versus "quit." In Symphony, it is exit, which is less clear, but probably the Q is taken for something else.

Q. What was the Q word taken for?

A. In Symphony, it was probably "query." So we needed a word other than one that began with a Q that meant stop the program and leave, so we used "exit," which is less clear than "quit."

Q. I believe you referred to a concept that you called shallowness in the menu.

[155] A. Mm-hmm.

Q. Could you tell me what you mean by shallowness in the menu?

A. Yes. Requiring the fewest keystrokes; being nearest the top of the menu hierarchy.

Q. And can you expand on that? What does that mean to the user?

A. It means two things. One is, the first is that you need to type fewer keystrokes to get to it, and that is useful when you use the same thing over and over again. It also means that if



you are looking around for it, you're more likely to find it sooner rather than later.

Q. So I take it that there is a guideline which essentially states that the author of a menu command hierarchy should permit the user to get to the end of the tree as fast as possible? Is that correct?

\* \* \*

A. You can't get to the end of the tree all the time as soon as possible. Some things have to require more keystrokes, which will take you longer, and others shorter. In general, the guideline is: [156] The more often you do something, the sooner you want to have the user reach that end of the tree.

Q. Can you give me an example where that guideline was put into practice with respect to version 1.0?

A. Yes. This is one of the rare cases where I remember one. In the case of the move command, it's slash move, and it does it; and copy is the same way. I, for instance, was advocating making it slash range move, two keystrokes, with the negative effect of requiring an additional keystroke and requiring the user to look for it but with the positive effect of consolidating our top-level menu.

\* \* \*

[158] Q. I believe you testified, Dr. Gottheil, that another guideline would be that the first letters would have to be different. Is that correct?

A. Under the design guidelines that we used for 1-2-3, yes. Now, that is a guideline that has been frequently violated by other products at other times, but we were working from that assumption.

Q. How can that rule be violated?

A. It can be violated by highlighting in some way other than the first letter in a command and make that the selection key. That is the convention, for instance, under Windows. The drawback is that now [159] the user has two things to remember: the name of the command and the activating letter.

So it is clearly preferable to have the first letter be the activating letter.

Q. Was an example of the guideline in practice of not having first letters be the same in command terms the words "erase" and "extract"?

A. That's the only violation I can remember in the original 1-2-3.

Q. Can you explain to me that potential violation and how it was solved?

A. In that case it was decided that for "extract" we would spell it without the initial E and therefore the first letter would be X.

\* \* \*

Q. I believe you also testified, Dr. Gottheil, that there was a guideline that no more than seven commands should appear in any menu line. Is that correct?

[160] A. That is correct.

Q. What is the basis of that guideline?

A. There is an article by Herbert Simon called The Magic Number Five Plus Or Minus Two in cognitive psychology dates back, I think, to the early '60s. I've recently reread the article. It doesn't quite say what we thought it said. Nevertheless, it has been a useful guideline because the purpose is to keep the number of choices available to the user at any one time to a small enough number so that they can find their particular choice quickly.

Q. Was that guideline ever violated with respect to 1.0?

A. Frequently.

Q. Can you give me an example?

A. The top-level menu, the worksheet menu, the format menu, and probably many others.

Q. Concerning the worksheet menu, why was it violated, if you know?

A. I don't know specifically with respect to the worksheet menu or any other. The reason it got violated is because it was felt that it was better to put a few more commands on those

particular levels [161] than any of the other choices, to make the menus deeper or to move them to other menus.

BY MR. KONRAD:

Q. Just for clarification, when you say worksheet menu there and format menu there, you mean the submenus branching from those two commands in the top-level menu?

A. In the case of worksheet, from the top level; the things under worksheet. In the case of format, it is under range format and those are the choices under there. There are more than seven there.

MR. KONRAD: Thank you.

BY MR. GELHAAR:

Q. And with respect to the violation that you just mentioned where more than seven commands appeared on the menu line, did that guideline give way to another guideline?

A. It gave way to a general sense that the other guidelines singly or together—I don't know which in any one case—overrode that one. Always a judgment call, always an aesthetic judgment, a judgment of what seems and feels right, what falls readily to hand when you use it.

[162] Q. Another guideline you mentioned was that words should be as untechnical as possible. Did I get that correctly?

A. Yes.

Q. Can you give me an example in the context of the creation of 1.0 menu command hierarchy where that guideline was put into effect?

A. No, I can't.

Q. Do you recall any discussions with anyone during the creation of 1.0 where that guideline was discussed?

A. I cannot recall specific discussions and therefore I cannot recall the content. I recall that being an argument used in favor or against choices, but I don't remember what the choices were.

Q. So you recall that just generally. Is that correct?

A. Yes, yes. And the kind of exchange would be "Only a tech weenie would understand what that means."

Q. And lastly from my list of guidelines that I believe you testified about was what you referred to as aesthetic considerations of words and their order. Is that correct?

[163] A. Yes.

Q. I believe you testified about the aesthetic considerations of the word, but could you tell me what you mean by the aesthetic considerations of the order of the words?

A. I have no specific example. I just have a sense that in all cases you step back and you say, for instance, could a pairing of words be construed to have a meaning together? You just look for those things or they get pointed out to you during the testing of the product by the team saying, no, you can't put those words together. Let's separate them. They're too confusing. They mean something together that we don't want to imply, whatever like that.

\* \* \*

[164] Q. I guess what I'm getting at, Doctor, is: Are there any other guidelines that you have employed at your work at Lotus that are in addition to those which you've just mentioned?

A. Probably, but they don't come to mind. As I say, it is like writing; it is sitting down and trying to communicate. And the primary thing one does is try to adopt the point of view of the new user or the user new to that part of the product, and just say what would I think. So you don't go through a series of rules and generate an interface. You write something down, look at it and say, does this tell me what I need to know? Would I understand what I'm about to do? Could I get myself in trouble? That sort of thing.

\* \* \*



UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS

Civil Action No. 90-11662-K

LOTUS DEVELOPMENT CORPORATION,  
*Plaintiff,*

vs.

BORLAND INTERNATIONAL, INC.,  
*Defendant.*

DEPOSITION OF FRANK A. INGARI, JR., a witness called on behalf of the Defendant, taken pursuant to the Federal Rules of Civil Procedure before Carol H. Kusnitz, Registered Professional Reporter and Notary Public in and for the Commonwealth of Massachusetts, at the Offices of Hale and Dorr, 60 State Street, Boston, Massachusetts, on Tuesday, August 6, 1991, commencing at 10:05 a.m.

PRESENT:

O'Sullivan Graev & Karabell (by Henry B. Gutman, Esq.) 30 Rockefeller Plaza, New York, NY 10112, for the Plaintiff.

Fenwick & West (by Mitchell Zimmerman, Esq., and Lisa A. Olson, Esq.) Two Palo Alto Square, Suite 800, Palo Alto, CA 94306, for the Defendant.

\* \* \*

[101]

\* \* \*

Q. You testified that Lotus would not want to [102] change its command structure because "we consider it to be one of the most precious assets we have." Do you see that testimony?

A. I do.

Q. By "command structure" there you were referring to the names of the commands in 1-2-3's menus and the way the commands were arranged in the menus; is that correct?

MR. GUTMAN: Object to the form.

A. We mean the particular commands, the word choices of the commands, the first letters of the commands, the arrangement of the commands in a particular moving-cursor menu, with appropriate associated submenus, that complete complex of menu choices and their arrangement.

Q. Okay. Why did you consider that to be one of Lotus's most precious assets?

MR. GUTMAN: Object to the form. Why did he at the time of his testimony? Is that the time frame you were addressing?

Q. At the time you made the statement, "We consider it to be one of the most precious assets we have," why did you consider the command structure—

MR. GUTMAN: As of February of '89.

[103] A. Lotus 1-2-3 is sort of like the Beatles. It is a phenomenon. There are millions of users. The collective usage of this product by millions of people amounts to a sort of collective wisdom of how to achieve functional benefits through a specific expression of a software product. That knowledge base, fingertip knowledge as it's called, was a tremendous advantage to us, because we believed and I still believe, as a private individual, that people are more willing to stay with a software program which they understand and with which they are familiar at a physical tactile level.



In other words, hundreds of thousands of people type 1-2-3 as you and I might type on a Qwerty keyboard. They know those sequences of commands in their fingertips, if you will. That was an extremely strong incentive for users to stay with Lotus, and to upgrade to future versions of our products, and perhaps to purchase services from our company.

Secondly, because we believed that the particular design work that had been done by Jonathan Sacks and Mitch Kapor was particularly brilliant, that it was a brilliant and economical [104] expression of a way to work with numbers in rows and columns. It wasn't the only way, but it was very fast, very compact, very elegant.

Q. Is it fair to say that you did not consider the command structure to be one of Lotus's most precious assets because the arrangement of commands into menus and submenus was more logical than the arrangement of commands in menus and submenus of other spreadsheets?

MR. GUTMAN: Could I hear that back, please.

(Question read)

MR. GUTMAN: I'll object to the form of the question.

A. I don't recall ever having a conscious thought about its logical quality versus someone else's expression of a way to achieve the same result. My beliefs were founded on 1-2-3 itself. You have to remember this product dominated in terms of installed base, and we were more focused on our customers and their feelings than we were on whether it was more logical than another product. We felt that this asset was uniquely strong. Even if someone had brought out a different expression that [105] was more logical, we felt very strong with what we had established.

Q. I mean, even if there were another way of organizing commands into menus that was more logical, that what made this a precious asset in your view was that millions of people were used to it?

MR. GUTMAN: Object to the form.

A. No, as I said before, there were multiple reasons why it was a precious asset. One is it had been so successful, which in many ways was a proof of it, and two was that it was extremely elegant, compact and efficient. The word "logical" is your word. It is not one that would in fact occur to me. My word would probably be "intuitive" as opposed to "logical."

But those are words. Those are opinions. It is not only because millions of people used it. It was not because it was a standard so much as that it was—there were reasons why it was a standard, which was it was damn good, which is how it became a standard.

\* \* \*

IN THE UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS

No. 90-11662-K

LOTUS DEVELOPMENT CORPORATION,  
*Plaintiff,*

vs.

BORLAND INTERNATIONAL, INC.,  
*Defendant.*

DEPOSITION OF BECKY D'ADDEA JONES

Thursday, September 5, 1991

Reported by: Darleen J. Henry, CSR #3599

\* \* \*

[27] Q. Well, I'm asking for your view about the marketing to this kind of account, and I'm saying—what I'm asking is, do you recall whether you had a view back at the time before Quattro came out that you needed to have the 1-2-3 menu trees in Quattro in order to reach those customers?

A. My view was that we needed to protect what they had. That meant I wanted to make sure that their files could be read and that their macros could be used. How technically we got there, that was not my concern.

Q. Trying again to focus on the time just before Quattro came out, and I realize it's difficult and artificial to some extent at this point, but trying to do that, can you recall anyone else at Borland expressing the view that we have to have this 1-2-3 compatibility in order to reach those corporate accounts?

A. I don't recall.

\* \* \*

[116] Q. On the cover memo in the last paragraph you refer to several individuals. There are a couple of new names there. One is Roy Kayn, K-A-Y-N. Who is he?

A. Sales.

Q. And there's a reference to a Mark Andrews; who is he?

A. He was in charge of training.

Q. Training for whom?

A. He did internal training on Borland products as well as demo disks.

Q. What department was he in, do you recall?

A. He was part of the sales organization.

Q. Do you recall who was head of sales at this point in time, mid '88?

A. Doug Antone.

Q. And he still is today?

A. Yes, he is.

Q. Excuse me. If you'd look at the page that's stamped 519315, the top section on "Compatibility," at the end of it there's the sentence that appears in the later version about habitual keystrokes.

[117] There's a sentence on a special section in the documentation that's similar to a sentence in the later version. The last sentence, though, reads, "Therefore, no retraining, no relearning is necessary." Do you see that?

A. Yes, I do.

Q. Did you write that?

A. Yes.

J.A. 654

Q. Were you referring there to the point that 1-2-3 users wouldn't have to be retrained or learn a new menu tree to work with Quattro Pro because of the 1-2-3 menu tree?

A. Yes.

Q. Now, you can compare them if you want. I think counsel has the previous one. But that one sentence—there may be some wording changes in the other sentences—but that one sentence has not a draft date. Any reason why?

A. These things get tweaked all the time.

Q. I understand, and I could not possibly myself explain all the changes that I have ever made in editing documents. I'm just wondering if you can recall any reason for that one being dropped?

A. No. Like I said, these get tweaked.

\* \* \*

J.A. 655

IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF MASSACHUSETTS

Case No. 90-11662-K

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LOTUS DEVELOPMENT CORPORATION,

*Plaintiff,*

vs.

BORLAND INTERNATIONAL, INC.,

*Defendant.*

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DEPOSITION OF PHILIPPE KAHN

Wednesday, May 22, 1991

VOLUME I

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Reported by: Deborah A. Fryer, CSR #5191

\* \* \*

[57] Q. You testified, actually I don't believe it [58] was even in response to a question, that the reason you put the 1-2-3 compatible menu trees in Quattro and Quattro Pro was for purposes of macro compatibility?

A. That's correct.



Q. Was another purpose to take advantage of the fact that there are many users out there who know how to use 1-2-3 and are familiar with the sequences of keystrokes necessary to accomplish certain tasks using 1-2-3?

A. No.

Q. So you were not trying to take advantage of that learning curve or experience that 1-2-3 users have?

A. No.

Q. That was no factor at all in the decision?

A. No.

Q. And your answer covers both Quattro and Quattro Pro?

A. That's correct.

Q. Is that still not a factor today?

A. That's correct.

\* \* \*

[65] A. My recollection at the time where we made the decision that we needed to have the 1-2-3 compatible menu tree in order to run macros was because studies that were published by newspapers, magazines at the time, if I remember Adam Bosworth and I looked at that and I think what we concluded was that, if I remember well, over 50 percent, I think, I think it was over 50 percent of the people, maybe 60 percent, I don't recall exactly, of the people using the spreadsheet 1-2-3 actually made use of worksheets that included some form of a macro.

Q. And did that information play any role in your decision to incorporate the 1-2-3 menu trees?

A. It was important, yes.

Q. Would you say that was the most important factor in the decision?

A. The information you're talking about for running the Lotus macros?

Q. Yes, that information.

A. That information was important together with some other information that I'll describe in a second, because it

showed us that for this product to [66] be marketable we needed to be able to execute macros.

When we brought the product beta testing, I recall that beta testers would tell us that we couldn't run some of their macros because the beta test versions of Quattro Pro right before it shipped did not include a 1-2-3 menu tree. Actually we didn't have one and we couldn't execute the macros.

And those two facts really against our will, I remember discussing this with Adam, those two facts really showed us that macro compatibility was the key to being able to have a product that could have any chance in the marketplace.

Therefore, almost at ship time Adam and I basically decided that we had to build, using the Menu Builder, a 123.RSC file, a resource file, that would allow as many as possible of the 1-2-3 macros to execute properly.

\* \* \*

[95] Q. Now, back in the context of your conversation with Bosworth, you referred to a belief that, and again, I'm just trying to put you back in context, your testimony is in the record and that controls, but you said that for this product, referring to Quattro, to be marketable, it needed to be able to execute macros.

Were the macros you were referring to there, sir, 1-2-3 macros, or was it sufficient for Quattro to be marketable for it to be able to execute Quattro macros?

A. I'm referring to 1-2-3 macros.

[96] Q. Is it still your belief that in order for Quattro to be marketable or Quattro Pro to be marketable it needs to execute 1-2-3 macros?

A. I don't know.

Q. You don't have any view on that subject today?

A. What do you mean by "view"?

Q. Belief, opinion, notion?

A. It's a difficult subject, complex.

Q. That isn't the question, sir, do you have a view or opinion or belief on that subject?

A. No, that's my answer, it's a difficult subject and I don't usually express beliefs that cannot be, you know, at least reasonably understood.

Q. I'll try it a third time: Do you have a belief on the subject of whether Quattro or Quattro Pro in order to be marketable still needs to be able to execute 1-2-3 macros?

A. I don't know.

Q. At the time of the conversation with Bosworth, did you discuss any ways to permit Quattro to run, or excuse me, to execute 1-2-3 macros without incorporating the 1-2-3 menu tree?

A. Yes.

\* \* \*

[99] MR. GUTMAN:

Q. Yes, and my question to you was did you discuss with Bosworth whether it was possible to achieve the ability in Quattro to execute 1-2-3 macros by means other than the incorporation of the 1-2-3 menu tree, your answer was "yes," and I then asked you to tell me about that conversation, and I will now repeat that question: Please tell me whatever it is you recall about that conversation.

A. Sure. We discussed the fact that Lotus macros can be interactive, in other words can display commands on the screen, and therefore it became obvious that in order to execute 1-2-3 macros you had to build a menu tree similar to the one that is encapsulated in the 123.RSC file.

\* \* \*

[100] A. We also at that time realized that macro translation was not a viable way to do things because Lotus macros can be self modifying. In other words, because a macro can modify itself, if you use the stand-alone translator, then of course the translated version of that macro couldn't modify itself.

The analogy I can use here is the analogy of French and English. Once I've translated French into English, I can't interactively keep on speaking French, it's English, and the point that we made, just as you yourself, Mr. Gutman, couldn't understand my definitions when I wrote them in French on my piece of paper, I'm sure you'll agree that, well, the same thing is true for translating macros. So we realized that self-modifying macros ruled out the possibility of using translators.

On top of that one important feature that [101] Quattro Pro, or Quattro, sorry, it's not Quattro Pro, it's Quattro, was doing by design that no spreadsheet did at the time, to the best of our knowledge, was macro debugging.

And when it came down to macro debugging it became obvious that macro translation didn't work either. I think that Quattro Pro, or Quattro, sorry, was the first product ever, or first spreadsheet, I think ever to do debugging. I think that Lotus 2.3 now, several years later, has added that feature.

So as far as I recall, those were the three kind of points that we discussed.

\* \* \*

[103] Q. Did he ever suggest to you other alternatives that he had considered?

A. That he'd considered?

Q. Yes.

A. What do you mean by "considered"? Looked at?

Q. Looked at, contemplated, analyzed; pick your favorite synonym.

A. I just gave you the reasons why others couldn't be really seriously looked at, I described extensively why, logically, any person who's technical enough to know that understands that translation doesn't work, actually I did more than answer your question.

If you're a logical person you do understand at that point that we looked at many ways to do things and the only reasonable way, for the reasons I just expressed, was—that you could execute in a reasonable way macros was to actually



incorporate a file such as 123.RSC with the shipping version of Quattro.

\* \* \*

[118] personally, I mean I have done, I have done personally thinking for many years about language translators.

What I mean by "language translators" is compilers, debuggers and all that, that's how Borland started, and in that respect give a lot of thought to these kinds of issues, not specifically to the Lotus case, but they apply to areas such as these.

So if you're asking whether I have done and others of the company have done this kind of thinking, it's part of what we do when we design compilers, when we design interpreters, when we design debuggers, and in that respect, you know, the answer is as I gave it to you before, because you have self-modifying code.

If I'm going to use the terminology that's used usually, which is what you call self-modifying macros and interactive macros, there's not many ways to do it, and the rest is pure speculation.

MR. GUTMAN:

Q. Have you made any effort today to determine the extent to which people actually make use of self-modifying or interactive macros or macro debugging? And by "you" I mean you personally or, to your knowledge, Borland?

A. There are clearly on the product, I mean on [119] the market, commercially-available templates that you can buy from third-party companies that actually use these, I'm sure there are, and you know, interactive macros are part of every menuing system built with macros in a spreadsheet, as such.

So I mean it's pretty obvious that it's a feature that's important to users, so you know, it's a well-known fact in the industry.

Q. So you think there's an industry consensus that these are important issues for users?

A. I don't know what you mean by "industry consensus."

Q. Well, you say it's a well-known fact in the industry. My question is is this something upon which all right-thinking people in the industry agree, that is that these three issues, self-modifying macros, interactive macros, and macro debugging, are important to users?

\* \* \*

[120] A. So, I'm just answering your question, no one ever agrees completely in the industry, you'll always find people who disagree with opinions, that's why this industry is so diverse.

So the answer to this question, to the question as you put it, is can't answer that. What I'm saying is it's pretty clear to people who use spreadsheets and macros that interactive macros are important, and for some interactive macros are important, for some self-modifying macros are important, to others macro debugging is important.

\* \* \*

[146] it's going to hurt us"?

A. I can't recall, it's possible, I answered that question, I can't answer it three times. I answered it, it's possible, I can't recall precisely.

I talk to a lot of people every day about a lot of subjects, and believe it or not this issue is not one that I spend my life on.

Q. Well, was it an important issue during the week after we sued you?

A. Certainly was an important issue.

Q. Was it an issue that you focused substantive attention on during that period of time?

A. What do you mean by "substantive"?

Q. Material attention?

A. Listen, I spent a few hours on it, that's all, I have a company to run and lawsuits don't help me run my company, so I don't—I delegate that kind of thing, that's why I have counsel. I trust that they will come up with the best advice.



Q. But your outside counsel didn't participate in those discussions, did they?

A. I don't know. I mean we have inside and outside counsel, and there were a lot of people, especially Bob Kohn, focusing on that, and I trust Bob a lot. And I tell Bob, you know, "You tell me [147] what we should do," I delegate to him, and he tells me, but that's all.

Q. Well, was Bob Kohn equipped to decide whether or not there would be a major impact on your ability to continue to market Quattro if you took out the .MU file, the 1-2-3 compatible menus?

A. Bob has been in the industry for a long time and with the company for a long time and I trust his judgment.

Q. So you would defer to his judgment on the question of whether or not you would be able to market your program without 1-2-3 compatible menus?

A. I would.

MR. GREGORIAN: Talking about the marketing point as opposed to any legal point?

MR. GUTMAN: I have been for several questions now.

MR. GREGORIAN: Okay, fair enough, you can answer.

THE WITNESS: As a matter of fact, I probably would because Bob used to run international sales at Borland, as well as being the corporate counsel, so he's very much aware of marketing issues. Bob wore two hats at Borland.

\* \* \*

IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF MASSACHUSETTS

Civil Action No. 90-11662-K

\_\_\_\_\_  
LOTUS DEVELOPMENT CORPORATION,  
*Plaintiff,*

vs.

BORLAND INTERNATIONAL, INC.  
*Defendant.*

\_\_\_\_\_

APPEARANCES:

O'SULLIVAN, GRAEV & KARABELL 30 Rockefeller Plaza,  
New York, New York 10112.

For the Plaintiff.

BY: KERRY L. KONRAD.

FENWICK & WEST, Two Palo Alto Square, Suite 80,  
Palo Alto, California 94306.

For the Defendant.

BY: EDMOND C. GREGORIAN.

DEPOSITION OF DAVID E. KIERAS  
TAKEN OCTOBER 7, 1991

\* \* \*

[24] Q. Is there a generally accepted definition of the term?

A. I don't know that I've ever seen it defined anywhere.

Q. Do you consider yourself to be a computer scientist?

A. Yes, I would say yes.

Q. Do you have a degree in computer science?

A. No.

Q. Your degrees are in psychology?

A. That's right.

Q. What experience do you have with respect to the development of microcomputer software?

A. What do you mean by microcomputer?

Q. What is commonly called a personal computer.

A. Personal computer such as a PC or MacIntosh?

Q. Yes.

A. I've developed very little software for those particular platforms.

Q. Developed what?

A. Very little software for those particular platforms.

Q. When you say very little, how much?

A. A few small programs. I've supervised other people writing a few programs.

Q. What few small programs are you thinking of?

A. Like a program to translate between file formats, [25] supervised people developing software in SuperCard.

Q. What do you mean by that?

A. Excuse me?

Q. What do you mean by that?

A. What do I mean by —

Q. Developing software under SuperCard?

A. For my research.

MR. GREGORIAN: That's not what he said. Object to the form.

Q. (By Mr. Konrad): What is SuperCard?

A. It's a HyperCard like program.

Q. And what have you supervised people developing using SuperCard?

A. Software for use in my research.

Q. Has any software program that you've worked on ever been commercially sold?

A. Commercially sold?

Q. Yes.

A. No.

Q. Have you ever worked for a personal computer software company?

A. I will have to ask you to say what you mean by worked for.

Q. Been an employee of or even consulted for.

A. Yes, I have a consulting arrangement with one, but [26] the arrangement was to help them develop their proposal which if funded I would be a formal consultant for. So I did spend time helping them develop the proposal.

Q. Proposal for what?

A. To develop some software.

Q. And what company was that?

A. Personal Bibliographic Services.

Q. What kind of software was this?

A. This was software to augment some data base retrieval operations.

Q. But you didn't work on an actual product?

A. That's correct.

Q. In any of your studies, have you attempted to analyze how individuals use personal computer software in the work place?

A. Excuse me?

Q. In any of your studies, have you attempted to analyze how people actually use personal computer software in the work place as opposed to under your laboratory conditions?

A. No, I haven't done any what are called field studies.

Q. Do you consider yourself an expert in the business of computer software.

[27] MR. GREGORIAN: Object to the form. What do you mean the business of computer software?

MR. KONRAD: Selling it, marketing it, running a company that makes software.



THE WITNESS: No, I don't.

Q. (By Mr. Konrad): Do you consider yourself an expert in what makes people buy software?

A. What makes people buy software?

MR. GREGORIAN: Object to the form, it's vague and ambiguous. Is that different from marketing or—I mean, if you're after something else, you ought to specify what it is.

Q. (By Mr. Konrad): Consumer behavior with respect to the purchasing of commercial software.

MR. GREGORIAN: Object to the form. You can answer if you understand the question.

THE WITNESS: Well, I would not call myself an expert on why people make purchasing decisions.

Q. (By Mr. Konrad): In any of your studies, have you attempted to analyze the extent or manner in which personal computer software users use macros?

A. What do you mean by my studies? Researchers do a lot [28] of different types of things.

Q. In any of your studies, research that you've done of any nature, have you analyzed the extent to which people use macros?

A. The extent to which?

Q. Yes.

A. It sounds like what you want to know is have I collected any data or done any analysis that would allow me to say how often people use macros.

Q. Correct?

A. No, I have not.

Q. Have any of your studies attempted to analyze the manner in which people use macros?

A. The manner, the reasons why they would use macros?

Q. Yes, the reasons why, how they do it in practice.

A. In practice?

Q. In the field.

MR. GREGORIAN: He said he didn't do any field studies.

MR. KONRAD: Fair enough.

MR. GREGORIAN: You have three questions in there.

MR. KONRAD: Fair enough.

MR. GREGORIAN: Two of which are different.

[29] MR. KONRAD: Fair enough.

Q. (By Mr. Konrad): In any of your studies have you attempted to analyze the manner, the way in which people use macros?

A. In any of my studies, pieces of research, collection of data?

Q. Correct.

A. Carrying on analyses.

Q. Correct.

A. I would say to some extent, to a small extent.

Q. Which studies are you thinking of?

A. Well, this is why I wanted to clarify what you meant by study.

Q. Well, what did you have in mind when you answered my question?

A. I've presented user interface concepts to classes and short courses before. The subjects of macros does come up as one of the important parts of usability and what the very broad principles are for insuring that macro capabilities are easy to use, and that it's important that they be available, and that's the small extent to which my research has addressed that.

\* \* \*

[32] Q. (By Mr. Konrad): Is it your view that most computer scientists recognize human computer interaction as a distinct field of inquiry?

A. I don't really know whether they do or not.

Q. Would you agree that the field of human computer interaction has had difficulty gaining credibility among computer scientists?

A. Having difficulty, I wouldn't put it that way. I would say that it hasn't happened yet.



Q. Do you recognize the article "An Overview of Human Computer Interaction" from June 1990?

A. That's right.

Q. As one that you wrote?

A. Yes.

Q. Page 68 you wrote, "User interface design and other aspects of HCI also have a credibility problem within the computer industries and academic computer science." Is that a true statement.

MR. GREGORIAN: Give him the context. You're holding the article in front of you. He doesn't have it in front of him.

MR. KONRAD: It's there if you like.

[33] MR. GREGORIAN: Can you point to him where on this page?

MR. KONRAD: (Indicating).

THE WITNESS: Okay.

Q. (By Mr. Konrad): Is that a true statement?

A. Within the context, yes.

Q. What's particular about the context here that makes that true or let me put it a different way, in what context would that not be true?

MR. GREGORIAN: Object to the form, unintelligible.

THE WITNESS: I don't understand.

Q. (By Mr. Konrad): You say in the context it's true. In what context would it not be true, the statement you wrote here?

MR. GREGORIAN: Object to the form, it's unintelligible.

THE WITNESS: I don't understand how I can answer the question that way.

Q. (By Mr. Konrad): Can you imagine a context in which that statement would not be true?

MR. GREGORIAN: Object to the form. Just ask him what he meant by the context. Do you want information or do you want to play games and waste time.

\* \* \*

[40] Q. And would it be fair to say that some computer scientists have a view of HCI that does not place it within computer science?

MR. GREGORIAN: If you know.

THE WITNESS: I don't know that I've ever discussed that with anybody. It's possible but—

Q. (By Mr. Konrad): Well, in the same article, in "An Overview of Human Computer Interaction" you wrote what is the relation between HCI and computer science. "Computer science should include HCI but generally does not." Is that a true statement?

MR. GREGORIAN: Why don't you show him the context.

MR. KONRAD: It seems very straight forward.

THE WITNESS: The context here is concerning the disciplines, in particular the academic disciplines. It's not generally the case that computer science does require for example their students to take a course in HCI, and one of the signs that a field would be considered as fully part of another is if courses in that were required, that's not necessary, but if that's happened, that's usually because the faculty in that department have [41] decided it's an essential part.

Q. (By Mr. Konrad): Well, you also wrote that, and I think you just told me that this would be true, but let me ask to make sure. You wrote, "Thus courses in human computer interaction or user interface design are not common in computer science departments." Is that a true statement?

A. I believe that is, yes.

Q. You wrote, "Where they do exist, they tend to be viewed with some skepticism as being soft or not really engineering." Is that true?

A. I have had some experience with that myself. That's the basis of that statement, and it seems to be a fairly common attitude, but not necessarily a universal one.

Q. You wrote, "The field of HCI generally has a problem in that it has not established its credibility as a technical dis-

cipline in main stream computer science." Is that a true statement?

A. Generally I would. What I would say though again is that that is changing. The ACMSIG for example exists on this field. New curriculum proposals with computer science are being sponsored by ACM as a field of study.

\* \* \*

[46] Q. Did you take computer science courses during that time?

A. No, I didn't.

Q. Did you take any computer science courses at the University of Michigan?

A. At the University of Michigan, I'm pretty sure the only thing I did in the way of course work as far as I can remember is registered for a course in theory which I then later dropped.

Q. I'm sorry, which you then later dropped?

A. Later dropped.

Q. You said before that the issues involved in human computer interaction have been known since or have been dealt with in some way since computers began. Do you accept that persons active in the field of computer science before human computer interaction acquired a name as a field may have had understandings and experiences pertinent to that study?

A. Pertinent to that study?

\* \* \*

[55] (By Mr. Konrad): Did you and Professor Olson collaborate on your declarations?

MR. GREGORIAN: Object to the form. What do you mean collaborate?

MR. KONRAD: Work together in any way.

THE WITNESS: With your meaning of collaborate, the answer is I did not. I did comment back to Mr. Hayes I think it was on drafts of her declaration.

Q. (By Mr. Konrad): Did you edit her declaration in any way?

A. What do you mean by edit?

Q. Make words changes, mark it up?

A. No. I marked places that I thought I should comment on.

Q. Have you seen the final version of her declaration?

A. No, I haven't.

Q. Are you aware that 29 paragraphs of her declaration are almost verbatim the same as yours?

A. I noticed that in the earlier versions, yes.

Q. What explains that?

A. They're both drafted by the lawyers.

Q. Are you aware that 31 paragraphs of your declaration are almost verbatim with that of David Little, [56] L-i-t-t-l-e?

A. I haven't seen his declaration.

Q. Did the lawyers do the complete first draft for your declaration?

A. Did they do a complete first draft?

Q. Yes. Let me try it a different way. Was there any portion of your declaration for which you did the first draft?

A. That I did the first draft, I don't recollect whether any of the wording in any of my earlier notes showed up in that first draft or not.

Q. Now, in the very first paragraph of your declaration you state, "I am the person in the Department of Electrical Engineering and Computer Science at the University of Michigan who teaches computer user interface design." Do you mean to suggest that you are the only person in the department who ever teaches issues concerning user interface design?

MR. GREGORIAN: Object to the form. That's not what it says.

MR. KONRAD: It says, "I am the person," and I'm trying to understand how much emphasis we should put on the word "the."

MR. GREGORIAN: Why don't instead of paraphrasing what it says ask is there anyone who [57] teaches user interface



design issues in any course which basically is the thrust of the question.

MR. KONRAD: I asked the question.

Q. (By Mr. Konrad): Do you mean to suggest by that sentence, Mr. Kieras, that you are the only person in the department who ever teaches issues relating to user interface design?

A. That's not the intent of that statement.

Q. To your knowledge are you the only person who ever teaches issues concerning user interface design in the department?

A. No, there is at least one other person that teaches things related to that.

Q. Is it your understanding that in courses on software development and practices, computer science generally, issues of user interface design are not addressed?

A. Perhaps some aspects of it would be, but I teach the only course that is currently offered or has been offered to my knowledge that is specifically about user interface design.

Q. Do you know whether the issues of user interface design are addressed in other courses within the department?

[58] MR. GREGORIAN: Didn't he say he knows of one course or the one course.

Q. (By Mr. Konrad): Leave aside the one other course. In any other course do you know?

A. It's possible, but I don't have any direct knowledge of it.

Q. Do you have a comprehensive knowledge in your view of everything that is taught in any every course in the department?

A. No, I don't.

Q. Are you in charge of user interface issues for the department?

MR. GREGORIAN: Object to the form.

THE WITNESS: I don't know what that means.

Q. (By Mr. Konrad): Has the faculty delegated you the responsibility for teaching issues concerning user interface?

A. There is no official action of that sort.

Q. In Paragraph 3 of your Affidavit you say you are collaborating with another professor of computer science on the design of user interfaces for advanced computer aided design systems?

A. Yes.



SPECIALLY CONFIDENTIAL,  
SUBJECT TO PROTECTIVE ORDER

Volume I  
Pages 1 to 162  
Exhibits 1 to 14

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UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS

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Civil Action  
No. 90-11662-K

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LOTUS DEVELOPMENT CORPORATION,  
*Plaintiff,*  
vs.  
BORLAND INTERNATIONAL, INC.,  
*Defendant.*

---

CONFIDENTIAL DEPOSITION OF W. FRANK KING, III a witness called on behalf of the Defendant, taken pursuant to the Federal Rules of Civil Procedure, before Jessica L. Gonzales, Professional Shorthand Reporter and Notary Public in and for the Commonwealth of Massachusetts, at the Offices of Hale and Dorr, 60 State Street, Boston, Massachusetts, on Thursday, September 12, 1991, commencing at 10:00 a.m.

PRESENT:

O'SULLIVAN, GRAEV & KARABELL  
(by Henry B. Gutman, Esq.)  
30 Rockefeller Plaza,  
New York, NY 10112,  
for the Plaintiff.

FENWICK & WEST  
(by Mitchell Zimmerman, Esq.)  
2 Palo Alto Square, Suite 800, Palo Alto,  
CA 94306, for the Defendant.

\* \* \*

[79]

\* \* \*

Q. Okay. In your judgment, familiarity with the 1-2-3 menus is a factor that influences purchases of 1-2-3; is that correct?

A. Yes.

Q. And do you agree the ability to run spreadsheets that contain 1-2-3 macros is a factor that influences purchases of 1-2-3?

A. Yes.

Q. And ability to run 1-2-3 macros is a factor that influences purchases of competitive spreadsheets also; is that correct?

A. Yes.

Q. There are upwards of 7 million people who have used Lotus 1-2-3; is that correct?

A. I don't think your number's right.

Q. Well, what do you think is the right number?

A. Maybe twice that.

Q. And so perhaps 14 million people have used Lotus 1-2-3?

A. That's twice that.

MR. GUTMAN: We could stipulate to the [80] arithmetic.

Q. And those people are familiar with Lotus' menus and the menu structures and macros by and large; is that correct?

MR. GUTMAN: Object to the form and lack of foundation.

MR. GUTMAN: You can answer.

A. They're certainly familiar with the menu structure. Not everyone uses macros.

Q. In your judgment is it true that most of the 14 million or so people who are familiar with the 1-2-3 menus would be resistant to changing to a different menu structure?

MR. GUTMAN: Object to the form. Lack of foundation, but you can answer.

\* \* \*

[81]

\* \* \*

Q. Let me start from another point. Are you [82] aware of any evidence that people today—let me start again. Are you aware of any evidence that today people buy Lotus 1-2-3 in part because of its menus?

A. Oh, for sure.

Q. What is that evidence?

MR. GUTMAN: Object to the form. You can answer.

A. I talked to lots of customers.

Q. And what do they tell you about compatibility with menus?

MR. GUTMAN: Object to the form.

A. They say that compatibility with our menu structure is very important to them.

Q. Do they tell you anything else about the menus other than that the compatibility with menu structure is very important?

MR. GUTMAN: Object to the form.

A. The question is so broad the answer is Yes, they tell me lots of things.

Q. Do you hear from customers that any aspect of the menu structure other than compatibility plays a role in their decisions to buy 1-2-3?

MR. GUTMAN: I'm sorry, what do you mean by [83] "compatibility" in that context? Do you mean macro compatibility, or do you mean menu compatibility, keystroke compatibility?

Q. What do you understand "menu compatibility" to refer to?

A. The words, what they mean, how they're spelled, how they're laid out, the sequence, the hierarchy.

Q. And what do you understand "macro compatibility" to refer to?

A. There is a macro definition, language that the product supports, and you can write a program in that language, you can execute it in 1-2-3, that defines its correct operation. If you can take that same program and execute somewhere else and you get the same result, then I would say those two systems are macro compatible.

Q. If you take the same file and run it in two programs?

A. I didn't say "file."

Q. Is that the same program?

A. I said the same string of characters.

\* \* \*

IN THE UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS  
No. 90-11662-K

---

LOTUS DEVELOPMENT CORPORATION,

*Plaintiff,*

vs.

BORLAND INTERNATIONAL, INC.,

*Defendant.*

---

DEPOSITION OF ROBERT H. KOHN  
Wednesday, September 11, 1991  
VOLUME II  
CONFIDENTIAL  
ATTORNEYS EYES ONLY  
TRIAL COUNSEL ONLY

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Reported by: DARLEEN J. HENRY, CSR #3599

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\* \* \*

[227] A. I said that we would not have proceeded to spend millions of dollars in R&D and marketing to create expectations in our customers' mind expecting to have that feature or particular capability in the product.

Q. Well, is it your view that Borland has, in fact, spent millions of dollars to create an expectation in users' minds that

Quattro and Quattro Pro provide macro compatibility with 1-2-3?

A. I think not only Borland has spent millions of dollars, but customers have spent millions of dollars in their own time and investment in the Quattro and Quattro Pro line of products subsequent to our introduction to Quattro, and they have expectations about these capabilities that we said that we were going to provide.

Q. And in your view, Borland's customers have invested millions of dollars specifically in ways that depend upon the 1-2-3 compatibility in Quattro and Quattro Pro?

A. Yes.

Q. I take it you consider that macro compatibility to be a very significant feature of the product then?

A. Now that it's been shipping for nearly three and a half years.

Q. Did you consider it to be a very significant feature at the time Quattro came out?

[228] A. I don't know. I don't have any basis of judging whether something is significant or not at that time. That was something Philippe Kahn would have considered.

Q. Well, are you saying that Borland has spent millions of dollars in developing Quattro and Quattro Pro around the 1-2-3 compatible menu files?

MR. GREGORIAN: Is there a limit to these? He said what he said.

MR. KONRAD: He gave an opinion and I'm entitled to explore that opinion.

MR. GREGORIAN: I don't think it was an opinion. I think it was a fact.

THE WITNESS: I've already answered that question.

MR. KONRAD: Q. I'm not sure that you have. I'm sorry. I'm going to ask for an answer to it.

A. I've already answered the question.

MR. KONRAD: Could we hear it back, please?

(Record read.)



MR. KONRAD: Well, let me try again.

Q. You told me before about the millions of dollars spent investing and the like in creating expectations in [229] customers' minds; I'm trying to understand the nature of these expenditures.

Are you saying that Borland has spent millions of dollars in the development of the 1-2-3 compatible menu tree files?

A. No.

Q. Are you saying that Borland has spent millions of dollars in developing other aspects of Quattro and Quattro Pro specifically dependent upon the inclusion of the 1-2-3 menu tree files?

A. Given that "aspects" is a very broad term, the answer is yes.

Q. What aspects?

A. The aspects that I mentioned earlier, creating customer expectations about the product.

Q. Well, are you talking about the product itself?

A. And training people who are accustomed to use these features that they're expecting to get in marketing to these people who are expecting to continue to get this feature.

In making future versions of the products that were consistent with past versions of the products so that customers can continue to rely upon the expectations that Borland gave them from day one that we shipped the product.

[230] Q. Well, I really meant to focus on the product itself and not so much on the marketing and other things that you mentioned.

Are you saying that Borland has spent millions of dollars in developing parts of Quattro and Quattro Pro other than the 1-2-3 menu tree files in a way that depends upon the inclusion of those files in the products, specifically with respect to the product work?

A. You cannot just talk specifically with respect to the product because the product itself reflects customers' expectations. You develop products in order to meet customer needs.

Q. Are you saying that—strike that.

Are you aware of any particular expenditures in development of parts of Quattro and Quattro Pro other than the 1-2-3 menu tree files that would not have occurred if those files were not in there?

A. I'm not technically—

MR. GREGORIAN: Can I hear the question, please.

(Record read.)

\* \* \*

[236] He referred to marketing expenses at least four or five times in this sequence of questions, and frankly, I don't remember the context, and I doubt that he does, so when you say when you referred to marketing expenses, you know, at what point?

MR. KONRAD: Q. Well, do you—

MR. GREGORIAN: Maybe one reference was broad and one reference was narrow, I don't know.

MR. KONRAD: Q. Is it your view, Mr. Kohn, that all the marketing expenses for Quattro and Quattro Pro relate to creating an expectation in the consumers' minds that the product provides macro compatibility with 1-2-3?

A. I know that if you remove some feature that a customer expects to have, you have wasted millions of dollars over a period of three years in marketing the product.

Q. Well, is it your view that if you removed the 1-2-3 compatible menu trees today, all the money spent in marketing Quattro and Quattro Pro would be wasted?

A. I'm not saying that.

Q. Well, how much would be wasted?

A. This is like hypothetical and—

MR. GREGORIAN: Objection.

THE WITNESS: —and I don't understand [237] how I can hypothetically talk about this. I'm trying to simply say that the company spent millions of dollars in development acqui-

sition, marketing expenses over a period of time to create customers' expectations about that product.

MR. KONRAD: Q. In specific, an expectation would be macro compatible with 1-2-3?

MR. GREGORIAN: Objection to the form. That's not what he said in specific. He said there was millions of dollars spent on marketing; that's what he said.

MR. KONRAD: Q. Yes, but the customers' expectations that you're talking about, in this context, you're referring to an expectation that it would provide macro compatibility with 1-2-3?

A. Look, we're talking about a hypothetical situation as to whether Lotus would have any objection whatsoever which they never gave us. I don't know what that objection might be.

I don't know whether it would be macro compatibility. I don't know whether it would be the existence of the 123.RSC file or a number of things or whatever; they may have asked us to change a word.

It's all speculative as to what they would have asked us to do.

[238] Q. I'm trying to focus on these marketing expenses.

Do you believe that Borland would have spent less money marketing Quattro and Quattro Pro if the product hadn't contained a 1-2-3 menu tree file or hadn't been macro compatible with 1-2-3?

MR. GREGORIAN: Object to the form.

It's hypothetical.

It's compound.

I don't think it gives sufficient facts to answer.

THE WITNESS: I don't understand—

MR. GREGORIAN: If you can take a stab at it—

THE WITNESS: I don't understand the question because it's compound. I don't know what questions I'm supposed to be answering.

MR. KONRAD: Q. Well, is it your view that Borland would not have spent as much money marketing Quattro and Quattro Pro if the product hadn't contained 1-2-3 compatible menu tree files?

MR. GREGORIAN: Object to the form.

You know, come on. I mean, you know, they might not have brought out the product at all if this objection had been made timely.

[239] There's a whole range of possibilities here, and, you know, I really strongly suggest to you that you can—I know that you're clever enough and capable enough to spend all day on this line of questioning; I don't think it's productive.

MR. KONRAD: Mr. Gregorian, if you'll stipulate right now that this witness will not submit any affidavit in which he offers any view or opinion as to what Borland would or would not have done had Lotus taken some action at any particular time before this lawsuit commenced, and if you will stipulate that he will not offer in that affidavit or any such affidavit any views or opinions or testimony concerning any amounts of money or activities or acquisitions or whatever, that Borland did supposedly in reliance upon what Lotus did or did not do or say, I will happily cut this short.

If you're not prepared to so stipulate, if you have any intention of offering that kind of testimony on your own behalf, you're completely off base in trying to deflect me from the examination right now.

All you're accomplishing is making it extremely unlikely in my view that we will conclude.

MR. GREGORIAN: No, I'm not going to enter into that kind of stipulation—

[240] MR. KONRAD: Then I see no alternative but to proceed.

MR. GREGORIAN: —on the subject that got me nowhere. The last time I did that, the witness I told you wouldn't offer declarations, you wanted to depose anyway.



MR. KONRAD: I'm not sure that's right. I'll be happy to discuss that off the record because I suggest—

MR. GREGORIAN: I'm not inclined to enter into that kind of stipulation.

MR. KONRAD: Why don't we—I have no alternative but to proceed. Why don't we take the break that you suggested.

MR. GREGORIAN: All right.

(Recess.)

MR. KONRAD: Q. Mr. Kohn, you do believe, do you not, that if Lotus had objected immediately when Quattro came out to the inclusion of the 123.RSC file, Borland could have found a way to revise the product and continue to market Quattro?

A. Yes.

Q. Do you have any reason to believe that if that had occurred, Borland would not have continued to spend millions of dollars in further development and marketing [241] of the product?

A. I have reason to believe that we would have continued spending money to develop and market the product.

Q. Do you have any estimate in your own mind as to how much more Borland spent in further development and marketing of Quattro because the 123.RSC file was in there than it would have spent if it hadn't been?

A. Again, I think this is hypothetical to ask, I just don't know how I could probably have a basis for determining the answer to that question given the fact that we did include the 123.RSC file.

Q. Returning briefly, I hope, to the specific point of marketing, do you have any estimate in your mind as to how much of the marketing expense incurred in relation to Quattro and Quattro Pro referred specifically to the inclusion of 1-2-3 compatible menu trees?

A. I have no basis for the determining how to apportion marketing expenses.

Q. I appreciate that answer and I may be able to wrap this up quickly. I'm going to try at a more general level and I'm telling you up front that I am to see if we can get out of this.

Do you have any basis for apportioning in your [242] mind how much more Borland spent in marketing Quattro and Quattro Pro because it had the 123.RSC files or the 123.MU files?

A. I have no basis for comparing something against something that didn't happen.

Q. You mentioned before the acquisition of Surpass—again, whatever you said before about it will speak for itself, I'm just trying to introduce that subject.

Is it your view that Borland would not have acquired the assets of Surpass if the Quattro product at this time had not contained an 123.RSC file?

MR. GREGORIAN: You mean assuming some Quattro product was released but without a 123.RSC file?

MR. KONRAD: Exactly.

MR. GREGORIAN: As opposed to the other alternatives. Okay. Fine. You can answer on that assumption.

THE WITNESS: Again, I don't have any basis for determining what we would have done if something—what we would actually have done had something turned out to be what was not the case.

\* \* \*



J.A. 686

CONFIDENTIAL, SUBJECT TO  
PROTECTIVE ORDER

Volume II

Pages 2-1 to 2-95  
Exhibits 10-19

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UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS

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Civil Action  
No. 90-11662-K

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LOTUS DEVELOPMENT CORPORATION,

*Plaintiff,*

vs.

BORLAND INTERNATIONAL, INC.,

*Defendant.*

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CONTINUED CONFIDENTIAL DEPOSITION OF THOMAS M. LEMBERG, a witness called on behalf of the Defendant, taken pursuant to the Federal Rules of Civil Procedure, before Anne H. Bohan, Registered Professional Reporter and Notary Public in and for the Commonwealth of Massachusetts, at the Offices of Hale and Dorr, 60 State Street, Boston, Massachusetts, on Wednesday, July 3, 1991, commencing at 10:00 a.m.

J.A. 687

PRESENT:

O'SULLIVAN, GRAEV & KARABELL  
(by Henry B. Gutman, Esq.)  
30 Rockefeller Plaza,  
New York, NY 10112,  
for the Plaintiff.

FENWICK & WEST  
(by Edmond C. Gregorian, Esq.  
and Lisa A. Olson, Esq.)  
2 Palo Alto Square, Suite 800, Palo Alto,  
CA 94306, for the Defendant.

\* \* \*

[2-58] (Document marked Lemberg Exhibit 13 for identification)

Q. Mr. Lemberg, I show you Lemberg Exhibit 13 for identification, a reprint of an article that appeared in *InfoWorld* September 3, 1990. Have you seen this article before today?

A. I don't remember seeing it, but probably I did, since I read that publication, and I certainly read articles about us and about this matter.

Q. Calling your attention to the paragraph that begins at the top of the second page of the exhibit, it says, "Excel has a macro translator that gives 1-2-3 macros comparable functionality in Excel, Lemberg said. 'Lotus used that as an example of something that didn't violate our copyright,' he said."

Do you have any reason to believe you're quoted inaccurately in that respect?

[2-59] MR. GUTMAN: Object to the form.

A. I'm not certain that the first sentence is completely accurate. It's got the germ of accuracy, but I'm not sure—I don't believe I would have used the phrase "comparable functionality" in that context. I believe rather what I would have said is that Excel has a macro translator that runs many but not all 1-2-3 macros, but runs them in Excel. The phrase

"comparable functionality" appears to be the reporter's translation of what I just said into those words, and I'm not totally sure I think that's really a fair translation.

Q. Fair enough. Any other inaccuracies?

A. In the second sentence what I would have said, I believe—I don't recall the specific conversation, but what I would have said was that in the Paperback trial, we had discussions of macros, and Paperback's defenses about macro compatibility were used as an example, if memory serves, the Judge used them in his decision as an example of something that did not violate our copyrights, the translator facility that was in Excel that was discussed at trial.

\* \* \*

[Lemberg Ex 13 7-3-91]

InfoWorld September 3, 1990

Copyright (c) 1990 IDG Communications, Inc.;

SECTION: INDUSTRY; Reaction; Lotus; Pg. 46

LENGTH: 524 words

HEADLINE: Lotus Litigation Sparks Corporate Resentment; Suit Viewed as a Way to Gain Market Share

BYLINE: BY BARBARA DARROW

BODY: If Lotus Development Corp. thought it could help its competitive standing in corporate America by suing spreadsheet competitors, it may have another thing coming, said users and analysts.

The perception that Lotus is using copyright infringement litigation to retain market share has sparked some ill feeling among large corporate users. Moreover, corporate customers express worry that Lotus might attempt to extend its copyright to keystroke sequences, and thus to customer-written macros.

"The lawsuit is pretty despicable," said Rich Minutillo, a senior automation analyst with CIBA-Geigy Corp., in Medfield, Massachusetts. It would be "terrible for the industry" if Quattro Pro had to be changed so it didn't offer 1-2-3 keystroke compatibility, he added.

The manager of a large chemical company said such a move could prevent corporate users from continuing to use the complex Lotus macros they've developed over the years.

"If someone tries to copyright the macros [we use in calculating] our budgets, there'll be hell to pay," he said.

Others dismiss that notion, claiming that U.S. District Court Judge Robert E. Keeton's finding in the Paperback case precludes pushing copyright protection that far.

But Jack McGrath, who follows the industry for his Hingham, Massachusetts-based at Max newsletter, said that Lotus' lawyers didn't help matters by "crowing that 'Slash Range Format' is now copyrightable. But it wasn't and the judge said it wasn't," he added.

"If you follow what Lotus is saying [about copyrightability] to its logical conclusion, there may be an issue," said one analyst.

Lotus itself said this is not an issue.

"We believe the customer owns the macros that he or she creates," counsel for Lemberg, corporate counsel for Lotus. "Our quarrel is not with customers at all—it happens to be with a vendor or two we think have violated our copyright."

Excel has a macro translator that gives 1-2-3 macros comparable functionality in Excel, Lemberg said. "[Lotus] used that as an example of something that didn't violate our copyright," he said.

Other companies are unperturbed by the skirmish in the spreadsheet world. Baxter Healthcare of Deerfield, Illinois, uses 1-2-3, Releases 2.01, 2.2, and 3.0 and Excel. And though most users who wanted presentation-style graphics upgraded to Excel rather than to 1-2-3 3.0, none cited Lotus' litigiousness as a reason, said Glen Jurmann, manager for office technology.

Corporate critics contend that seeking to quell look-alike programs is bad business because it bucks the trend toward making applications more uniform looking and, hence, easier to learn and use.

"Sure, you can't take Lotus code and put your name on it, but certainly if there's a close look and feel to [another program], I have no problem," said Ivan Brass, vice president and director of information services for Manufacturers Hanover Trust, in New York.

Regardless of how the Borland case comes out, Lotus may be losing in the court of public opinion. "The Borland lawsuit cost them a lot of goodwill in and out of the industry," the analyst said.

GRAPHIC: Picture, no caption



IN THE UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS

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No. 90-11662-K

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LOTUS DEVELOPMENT CORPORATION,

*Plaintiff,*

vs.

BORLAND INTERNATIONAL, INC.,

*Defendant.*

---

DEPOSITION OF DAVID E. LIDDLE, Ph.D.

Thursday, October 10, 1991

CONFIDENTIAL  
ATTORNEYS EYES ONLY  
TRIAL COUNSEL ONLY

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Reported by: DARLEEN J. HENRY, CSR #3599

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\* \* \*

[7] Q. You are being paid to participate as an expert on behalf of Borland in this case; is that correct?

A. Yes.

\* \* \*

MR. GUTMAN: Q. I'll show you what's been marked as Exhibit 1, Dr. Liddle. Is that a statement you rendered to Borland with respect to your services in this case?

A. No, it's a statement I rendered to Fenwick & West.

\* \* \*

[46] Q. I have a question or two about some of the things in your background as reflected in your declaration.

It says here that you received a bachelor degree at the University of Michigan in electrical engineering.

A. Yes.

Q. Did you take any computer science courses then?

A. They weren't called computer science courses then, but I did take some.

Q. Do you know Bernie Galler?

A. I have met him, of course; he was a well-known professor at the time that I was there.

Q. Did you ever take any courses with him?

[47] A. I didn't directly have a course from him.

Q. Are you familiar with his reputation?

A. Sure.

Q. And could you describe it for me.

MR. GREGORIAN: His reputation generally or his reputation for some specific character trait?

MR. GUTMAN: His reputation for expertise in computer science.

He said he was a well-known professor at the time.

Q. Is it fair to say, sir, that Professor Galler is a well-recognized expert in computer science?

MR. GREGORIAN: You're asking now, though, you're not asking at the time, right?

MR. GUTMAN: I'm asking now.

If it's changed over time, I'd certainly be happy to hear about that.

MR. GREGORIAN: Your question is now?

MR. GUTMAN: Yes, now.

THE WITNESS: Ask me the question again.

MR. GUTMAN: Q. Is it your understanding, sir, that Professor Galler is a recognized expert in computer science?

A. It's my understanding that Professor Galler is a recognized expert in system design and system [48] programming of a certain class, and at the time that I was, for example, at the University of Michigan, he was well-known for working on a very complex and very modern host-based time sharing operating system, okay.

And that was work that I admired and was familiar with, and that Professor's Galler's reputation—and I don't mean to split hairs about what is and what is not computer science—has generally preceded the time in which computer science has developed a lot of its fine grain structure as a discipline.

So I'm really trying to give you the most honest answer and not in any way say anything bad about Professor Galler.

Q. I understand that.

A. To make the point, for instance, I don't know of Professor Galler having any particular expertise in computability theory, although I'm sure he's familiar with it.

I do know him to have worked a lot in the area of system programming.

I do know him to have done some imaginative and rather modern kind of industrial application.

So across the broad field of computer science, I would say that there are a number of areas that I [49] don't know him to be a recognized expert, but it's certainly the case that's he's been a long recognized educator in computing.

\* \* \*

[80] Q. Aren't there spreadsheet users, Dr. Liddle, who identify the horizontal arrangement across the top of a spreadsheet

screen of the words, "Worksheet," "Range," "Copy," "Move," et cetera, in that order to a particular spreadsheet product?

A. You're asking me for my guess about that or my [81] opinion about that?

Q. If you have no opinion or you have no basis for an opinion, you can say so, but the question is, isn't it the case that to some number of spreadsheet users seeing those words in that order horizontally across the top of the screen is something that they identify with a particular spreadsheet program, namely, Lotus 1-2-3?

MR. GREGORIAN: You're asking without regard to the manner in which they are presented, just the words and their order horizontally?

MR. GUTMAN: I'm talking about those words horizontally on a spreadsheet grid, on a spreadsheet screen.

THE WITNESS: Yes, I'm sure there are such people. They are called Lotus 1-2-3 users, and I'm sure they identify them that way.

If you went to Quattro Pro users who haven't been 1-2-3 users, it's almost certainly the case that they believe that those are—that those are commands from Quattro Pro somehow if they have seen them displayed in that way; but I would agree with you that it's likely the case that people who have used 1-2-3 associate that sequence of commands in that order as do Macintosh users associate—

Q. File, Edit, et cetera?

[82] A. Precisely. I think that's right.

Q. And that is part of the product's identity in that sense, right?

A. Yes, it certainly is.

MR. GUTMAN: It's 12:15, you wanted to break for lunch, Ed?

MR. GREGORIAN: Yes.



(Luncheon recess from 12:15 p.m.)

\* \* \*

[107] Q. Did you make any effort to determine whether the same sequences of keystrokes that would accomplish a certain result in Lotus 1-2-3 would in that mode of Quattro Pro accomplish the same result?

A. Yes, I did.

Q. And what was the result of that?

A. In all the cases that I tested, it did accomplish the same result.

Q. Did that strike you as coincidence or the result of an intentional design decision by Borland?

A. Oh, it was clear—it was clear to me that it had carefully been made so that those sequences of commands would produce the same results.

In fact, I also made some simple macros command on both to make sure that they would work in the same way in both, and, of course, those two things are inevitably linked.

Q. Is it your testimony, sir, that absent the existence of the 1-2-3 compatible menus, Quattro Pro would not be able to run 1-2-3 macros?

A. It's not my testimony that it would be unable to run previously constructed 1-2-3 macros.

It is my testimony that you wouldn't be able to modify or change or upgrade or debug previously constructed 1-2-3 macros.

[108] Q. So it's possible to run previously constructed macros without duplicating the 1-2-3 menu structure in the new program, right?

MR. GREGORIAN: Now you're asking a general question as opposed to one reference to Quattro Pro?

MR. GUTMAN: Yes.

THE WITNESS: Yes.

Let me, again, give you an expanded answer and tell me if it fits your need.

There's no facility that I know of to do that in 1-2-3—I'm sorry—in Quattro Pro, but when you say it is possible to—let me try and make a statement, see if that satisfies your need rather than answer directly to your question.

You could write a program which either interpreted a macro or failed, just said, "Oops, problem. Please go away and leave me alone," okay, that could parse well-formed macros and produce a final result, okay.

That's sort of Turing's definition of a computer, okay, is that it can recognize a given sequence of symbols. So it's clearly the case that one could make such an interpreter or compiler, whatever you want to think of it, and there's no question that you could do that.

[109] MR. GUTMAN: Q. I know you've read Bernie Galler's declarations, but in his declarations Bernie describes the fact that you could, if you wanted to, create such an interpreter of macros or you could do what Microsoft did with Excel, and do essentially a one time translation, and both of those are technically doable, right?

A. They're both certainly technically doable.

The pity is that it isn't what the customers want. In other words, you can do that technically, but that's only a technical stunt because the customers don't say that I want to use it one time and translate everything from 1-2-3 macro language over to a new one which now I can only use and which doesn't translate back.

What they say is, I have an asset base of all this stuff that I've built; I want it to be able to be interpreted by all the different spreadsheets that I buy. I want those spreadsheets to be able to modify those macros in a common way. That means that all of those different spreadsheets, I'll still be able to use them.



Q. So that argues for interpretation rather than one time conversion?

A. Yes.

[110] Q. But interpretation is technically possible, right?

A. Not only is it technically possible, that's exactly what's done. That is what Quattro Pro does.

In fact, the interior structure of Quattro Pro is only an interpreter anyway even in its native mode as opposed to the 1-2-3 mode.

\* \* \*

Q. And by your reference to interpretation in the internal works of Quattro Pro, are you referring to the fact that you have so-called menu equivalent commands that you can take commands from either the native Quattro Pro menus or from the 1-2-3 menus and they have a common identifier in terms of a menu equivalent command?

A. That's essentially what I'm referring to.

\* \* \*

[116] Q. Which is as to Quattro Pro, Release 1.

A. And Quattro.

Q. So it wouldn't —

A. Correct.

MR. GREGORIAN: What time is your call?

THE WITNESS: 2:30.

MR. GREGORIAN: He has a call he needs to take at 2:30.

MR. GUTMAN: I was about to start something. Let me see if I can do it in a question or two.

MR. GREGORIAN: All right.

MR. GUTMAN: Q. Paragraph 63 of your declaration, which is on page 20, seems to suggest that the words in 1-2-3 menus get incorporated somehow in macros and 1-2-3. That isn't really correct, is it, the words?

MR. GREGORIAN: Take time to read the paragraph because there's an assertion in that question about what you're saying in there that may or may not be accurate.

THE WITNESS: If I read the textual form of the macro, it's, of course, just a series of characters, most of which are letters and some are tildes—

[117] MR. GUTMAN: Tildes, T-I-L-D-E-S.

THE WITNESS: And other things.

Those characters are not unique in the commands that they represent without knowing what each character means in terms of the word it represents.

For example, "C," if it appears at the beginning, means "Copy," but if it's preceded by "R and F," it means "Currency."

So the keystroke "C," unbeknown to the word "Currency," isn't sufficient, okay.

In other words, the information contained in the keystrokes is not the same as the information contained in the words. You need the minimum of the words to construct or to decode the macros.

MR. GUTMAN: Q. Well, you need more; you need both the word and the hierarchical placement.

A. Yes, it is the ordering because it's what's called "context sensitive parsing." So for the human user either to construct or debug or change those macros requires the words and the hierarchy in which they fall.

Q. Or a good memory of that. If you have the hierarchy of the letters, you can do it without the words; but the words provide information if you don't remember what the "C" means after "R and F," isn't that

\* \* \*

[119] you don't have a grammar for interpreting those strings of characters.

\* \* \*

Q. Am I also right in understanding—and I believe that you say something to this effect in your declaration—that for

the various words used in the 1-2-3 menus, there are other words that one could choose that would convey the same meaning?

A. Convey the same meaning to a user. I think what I said is you could design—I forget what I said.

Anyway, you could design something where you [120] gave meaning to the term "Duplicate" instead of the term "Copy," and chose that as the consistently used word to mean that function, right.

In other words, although there are narrow groupings of words, in most cases the choice of words in the first instance is not unique.

Q. And, for example, range could be "Block" or something else instead of "Range"?

A. Right.

One could have designed 1-2-3 to say "Block," and "Duplicate," and—

Q. "Spreadsheet" instead of "Worksheet"?

A. (Witness nods head.)

Q. Isn't it also correct that if you were designing 1-2-3 over from scratch, not only could you use different words to represent each of those commands, but you could come up with various alternative ways of organizing those commands in the menus and submenu's and sub-submenu's; isn't that right?

MR. GREGORIAN: Is it just possible to do that, is that your question?

MR. GUTMAN: If you were starting over—let me give you a complete hypothetical.

If you were starting from scratch today, there was no 1-2-3, you were going to provide the same [121] functionality 1-2-3 does, but you were sitting down to design the menus, and assume for the moment we're using words instead of icons, which I know is not the way you would approach the problem.

A. That's right. It saves me the trouble of going through all that.

Q. Assume for the moment that you're doing it with words, isn't it right that as you sat down to design that set of menus, you would not only have the option of using different words to identify each of these commands, but you would have various options available to you concerning which of these commands you would put in the first level menu, which would be submenus, what the submenus would spring from; in other words, the entire structure, you would have the ability to make design decisions as to how to organize all of that?

A. Yes, there would be available to you some range of variability around each of those choices.

I was little bit unhappy that Professor Galler said that they were limited only by the English language or something like that because that seemed to me to be an excessively broad characterization. There aren't all that many choices, and you make the first set of choices, that limits the next set and the next set quite a bit.

[122] But it's certainly true that you have choices as to what the words are, what is, in a sense, left to right or sequential ordering of them at a given level, and then having made those choices, you have a smaller set of choices for which things go at the next level.

Those are to some extent determined by the first level, but for each word that you choose there, leaving out the ones already, blah, blah, blah, you still have a range of choices around all of those things.

Q. Again, taking as an example, Microsoft Excel with its menu addresses, essentially the same set of functions if not a greater set of functions than Lotus 1-2-3, but you have a series of menus and submenus and sub-submenu's that are substantially different; isn't that right?

MR. GREGORIAN: Object to the form of the question.

You've got the same set if not a greater set, substantially different.



I mean, you need to define some of those terms, I think, before he can answer that question.

MR. GUTMAN: Let me rephrase the question.

Q. In Microsoft Excel you have a spreadsheet [123] program which includes at least the basic functionality of Lotus 1-2-3 Release 2.

MR. GREGORIAN: Why don't you stop there and see if he agrees with that.

MR. GUTMAN: Q. Isn't that right?

MR. GREGORIAN: If you know.

THE WITNESS: Well, what release of Excel are we talking about?

MR. GUTMAN: Q. 1 point anything, anything before 3.

A. And you said that has at least the functionality of?

Q. 1-2-3.

A. 1-2-3 Release 2.0?

Q. Yes.

A. Yes.

Q. Isn't it also correct that the menus of that product, "File," "Edit," et cetera, with the various submenu's and sub-menus running from it—

A. Yes.

Q. —are substantially different from those of Lotus 1-2-3?

A. Yes.

\* \* \*

[124] Q. Isn't it also the case that not only could you find other words for the words in the 1-2-3 menus, but if you were so inclined, you could replace those words with icons?

A. In order to answer the question, I need to go back to what it is you're asking me to design.

Q. We're designing a spreadsheet.

A. For manual use?

Q. You mean for keyboard use as opposed to mouse use?

A. No, I mean for human use as opposed to programmatic or macro use.

Q. Yes, I'm talking about human use.

A. Understand that the point that I'm on is you are saying isn't it true that you could do that and isn't it true that you could do that, and I want to be sure that you understand that I'm answering that in the context of whether or not us producing a product with a cockpit from which I could fly, so to speak, which I, as an active user—

Q. Yes.

A. —could do these things?

Q. Yes.

A. We have specifically excluded any requirement so far associated with executing anything, quote, like [125] macros or anything programmatic.

Q. We're not talking about how you would go about addressing macros written using some other program.

A. Or any language.

Q. For the moment, we're not addressing whether this product even has a macro capability.

A. That's my point, so I don't want—the term spreadsheet to many people presumptively means it includes that kind of capability.

Q. For the moment let's assume that we're just talking about a spreadsheet that doesn't have macro capability.

A. In that case, I would agree—

Q. The words could each be icons?

MR. GREGORIAN: Let him finish his statement before you prompt him with your long prompts

THE WITNESS: That was, in fact, what I was about to say.

That being the case, I will agree that I could have used iconic or graphic or spatial controls rather than the specific selection of textual words within some range of the expressiveness of icons.

Now, let me point out that it wouldn't be a one-for-one mapping. The user interface would have to be profoundly different since the semantic distinctions [126] like "Range" and so on and are very, very hard to capture in an icon that's at all



meaningful or on a button that's at all meaningful by solely graphical means.

That's the reason why most buttons are ultimately labeled "Text" anyway since most of the abstraction associated with office applications don't lend themselves very well to iconography.

MR. GUTMAN: Q. So that's why both in your work at Metaphor and the Apple Macintosh, I understand that there are design decisions involved in what word and whether it's in the icon or under the icon?

A. Yes.

Q. But most of the icons end up being labeled since the images are not self-explanatory?

A. Right.

Q. And the word conveys meaning beyond picture?

A. Right.

Q. In your opinion, sir, is the inclusion of the 1-2-3 compatible menus in Quattro Pro something that's important?

A. Yes.

\* \* \*

[130] that successive versions of 1-2-3 also have that 1-2-3 1.0 does not have.

And the only way that it's at all civil in my view—civil is not a good word—at all comfortable or manageable to use the 1-2-3 compatibility mode in Quattro is pretty much if you just stick to the same little range of commands that you might be using in 1-2-3.

The addition of the Quattro Pro capabilities into the 1-2-3 compatibility mode, in my view, is very ugly. That is, it's hard to use.

Q. But doesn't having the 1-2-3 mode there give the user who already knows 1-2-3 the ability to get up and running on the new program immediately and then gradually broaden one's use to pick up the new functionality that was added in Quattro Pro?

MR. GREGORIAN: You mean can one do that, is it that possible or likely or what?

MR. GUTMAN: Q. You can answer the question. I think it's clear enough.

A. If I'm a familiar 1-2-3 user, if I read the manual as to how to bring up Quattro Pro in 1-2-3 compatible mode, I will be able right away with only a minimal amount of relearning to do certain things that I did in 1-2-3.

[131] It's not you can't instantly do it, but it's not—doesn't require very much learning to understand that.

For example, it takes you a little while to catch onto the fact that you're not going to see the going forward choices, but you are going to see all the nested things that you've just done, and you are going to see the state variables and so on.

So, fairly quickly, you can right away do whatever was the last thing you were doing in 1-2-3.

Q. And it's not very difficult, is it, to figure out how to get the program to run on 1-2-3 mode?

A. No. Well, it's fairly clear in the documentation.

Q. And you can set that as the default so that henceforth it will boot up that way, right?

A. Yes.

Q. As a general principle, do you think it's bad to cause users to have to learn new programs?

A. As a general principle what I do think is that there needs to be value to new functionality to justify learning a new program; in other words, I don't think it's good gratuitously to change programs horizontally for only the same degree of functionality.

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IN THE UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS

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No. 90-11662-K

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LOTUS DEVELOPMENT CORPORATION,

*Plaintiff,*

vs.

BORLAND INTERNATIONAL, INC.,

*Defendant.*

---

DEPOSITION OF JOANNE HIROMI LIN

Friday, September 6, 1991

CONFIDENTIAL  
ATTORNEYS EYES ONLY

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Reported by: DARLEEN J. HENRY, CSR #3599

---

[49] Q. Was the 1-2-3 program in QA at the time?

A. Yes.

Q. Do you have a copy?

A. Yes.

Q. Did you look at it in testing that file?

A. Yes.

Q. What do you recall in that respect?

A. We would write macros within 1-2-3 using the first letter key stroke, execute them against Quattro to make sure they ran.

At one point we also had two machines set up where we walked through the menu tree.

Q. When you say you had two machines set up, you mean you had two machines side by side, one with the developmental version of Quattro and one with 1-2-3?

A. Correct.

Q. When you say walk through the menu tree, what do you mean?

A. Pick the first item and then make sure that menu went to the same menu that 1-2-3 went to.

Q. You say "pick the first item," you'd hit, for example, the worksheet command in Quattro?

[50] A. Right, and you'd get a menu.

Q. Another menu which begins with global and it goes on with other commands?

A. Correct.

Q. And then you'd look at 1-2-3, pick worksheet, and then make sure that the same sub-menu appeared?

A. Correct.

Q. Do you recall that kind of testing finding anything that was out of order?

A. No.

Q. Did anyone help you in that particular testing, just the testing of the menu tree?

A. Yes.

Q. Who helped you?

A. The QA group.

Q. Anyone in particular within that group is what I meant.

A. No.

J.A. 708

Q. Do you recall at any point, before Quattro came out obviously, anyone suggesting to you in any way that you shouldn't look at 1-2-3 software or 1-2-3 manuals in connection with work on the 123.RSC file?

A. I don't recall.

\* \* \*

J.A. 709

IN THE UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS

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CIVIL ACTION NO.  
87-0076-K

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LOTUS DEVELOPMENT CORPORATION

Plaintiff and Counter-Defendant

vs.

PAPERBACK SOFTWARE INTERNATIONAL,

Defendant and Counter-Claimant;

and STEPHENSON SOFTWARE LIMITED,

Defendants.

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And Related Cases.

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DEPOSITION UNDER ORAL EXAMINATION  
OF JIM MANZI VOLUME II

---



\* \* \*

[323] First of all, what language is the source code for Lotus 1-2-3 written in?

MR. GUTMAN: Mr. Bezjian is out of the room.

MR. ERSPAMER: He's not here.

MR. GUTMAN: Is that specially confidential or is that something that's been disclosed?

A What version are you talking about?

Q Let's start with 1A.

A Most of it is in assembler. Most of 2 is in assembler.

Q Has the source code ever been translated in the C language?

MR. GUTMAN: What do you mean, by Lotus or somebody else?

MR. ERSPAMER: By Lotus.

A We're in the process of writing a new version of product that we have set publicly. I believe we've set publicly, and I don't care if it's particularly confidential. It's being written in C, which would be the fundamentals for release of 1-2-3 C.

\* \* \*

[412] A. I think, as I said earlier when we were having discussion about macros, that it is a serious issue to our customers on a list of a dozen kinds of issues of this magnitude for us to be asking them to do anything that would render work that they had done previously on our products obsolete.

So we strive as a company to provide a smooth transition path from one product to another and actually, in many ways, from one product to another family of products.

Q Is it Lotus' position that other spreadsheet manufacturers cannot furnish programs that are capable of running macros, Lotus 1-2-3 macros developed by Lotus' customers?

MR. GUTMAN: Could I hear that question back?

(The following question is read back:

"Question: Is it Lotus' position that other spreadsheet manufacturers cannot furnish programs that are capable of running macros, Lotus 1-2-3 macros developed by Lotus' customers?")

MR. GUTMAN: I'll object to the form of the question.

[413] You can answer it if you know what he's talking about.

A We're prepared to compete with anybody. There's a new product that has just come to market which I believe translates or runs Lotus macros. It's called Microsoft Excel.

As far as I know, we have no issue of that product.

Q To follow up on your answer, if you remove the existence of a translator from the process, would you have any problem with that in a spreadsheet program that directly processed Lotus 1-2-3 macros without translation or the use of a translator?

MR. GUTMAN: I object to the form of the question. Are you assuming that you are or are not violating Lotus' copyright?

A I don't understand what you mean by saying, would you have any problem? Meaning psychic, emotional, financial? What are you talking about?

Q Well, do you believe it would violate Lotus' rights?

A Which rights?

Q The intellectual property rights?

A I believe that the macros that people develop using our products are their property.

\* \* \*

SPECIALLY CONFIDENTIAL,

Volume I  
Pages 1 to 236  
Exhibits 1 to 11

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UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS

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Civil Action  
No. 90-11662-K

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LOTUS DEVELOPMENT CORPORATION,  
*Plaintiff,*

vs.

BORLAND INTERNATIONAL, INC.,  
*Defendant.*

---

CONFIDENTIAL DEPOSITION OF JIM P. MANZI, a witness called on behalf of the Defendant, taken pursuant to the Federal Rules of Civil Procedure, before Anne H. Bohan, Registered Professional Reporter and Notary Public in and for the Commonwealth of Massachusetts, at the Offices of Hale and Dorr, 60 State Street, Boston, Massachusetts, on Thursday, August 22, 1991, commencing at 10:00 a.m.

PRESENT:

O'SULLIVAN, GRAEV & KARABELL  
(by Henry B. Gutman, Esq. and  
Kerry L. Konrad, Esq.)  
30 Rockefeller Plaza,  
New York, NY 10112,  
for the Plaintiff.

FENWICK & WEST  
(by Edward C. Gregorian, Esq.  
and Stuart P. Meyer, Esq.)  
2 Palo Alto Square, Suite 800, Palo Alto,  
CA 94306, for the Defendant.

\* \* \*

[33] A. On CompuServe, right, that was one.

In terms of their awareness, I would have to conclude that they were aware on the grounds of the firestorming in the press that followed our filing of the lawsuit against Paperback, and if you did a frequency analysis of who was quoted more often than anyone else, I think it would probably be Mr. Kahn. This was not a silent little filing as far as our industry goes, so we also communicated our position through that open letter, I would assume that awareness was furthered by that.

And this was a topic of discussion, I would assume, I don't know that directly, but I would assume this was a topic of discussion, since I had seen evidence that he, at a minimum, was aware.

Q. "He" being?

A. "He" being Mr. Kahn.

Q. Anything else that you believe put them on notice?

A. No, nothing specifically.

\* \* \*

[127] So in its totality, it does include all that, but the piece that I would describe as sort of the diamond in the crown jewels has to do with menus: menu structure,

macros, key strokes, those kinds of things. People love the art that went into defining and making that.

Q. And there's what, seven million people out there who have used the product?

A. There's more than that, there are 7½ million legal users, there's some ungodly number of pirates of one form or another.

Q. And those people have through usage become accustomed to the menus and the menu structure and the macro language; is that fair?

A. Extremely fair.

Q. And as a result of becoming accustomed to it, they are somewhat resistant to changing to a different menu structure or macro language; is that right?

MR. GUTMAN: Object to the form and lack of foundation, but go ahead.

A. They are not only accustomed to it, they have built their businesses or their work lives around our product in many instances, and at the [128] same time a lot of people just out-and-out love the product and the way the product articulates or in a sense speaks through its menu structure to the user.

\* \* \*

[173] Q. Take a look at one more item, if you would, let me just get it for you. The item that I'm going to ask you about is preceded by a list of what I infer are Version 2.0 features, some of which are asterisked with a 1, and the Footnote 1 states, "These features may be implemented if menu changes do not largely affect compatibility."

A. Yes.

Q. Do you have any knowledge or understanding as to what that refers to?

A. No, I don't have a recollection. I don't understand what that is referring to either, where the 1 is referencing.

Q. Well, it's on a previous page.

A. It's on a previous page.

Q. There are a couple of them that are indicated on Page 25712, the third item, the fifth [174] item.

A. Yes.

Q. Jog any recollection on your part?

A. No. But again, if you said, What are the important issues that we worry about in product design on an ongoing basis?, I think I already testified that compatibility was at the top of the list. We actually had an experience around compatibility with Release 2.0 which was not totally nourishing for the company, and it was after the release of Release 2.0 and the subsequent release of 2.01 where the importance of compatibility was firmly stamped on everybody's forehead as the single, unifying concept that we had to manage from generation to generation of our products.

Q. And what was the problem of compatibility, sir, on Release 2.0?

A. My recollection of the problem, the 2.0 to 2.01 issue was that—and this is the level of attention that has to be paid and we do pay—is that we were about 99 44/100 percent compatible. We were incompatible on fundamentally undocumented features, and customers either found them or others that were documented, and we were off by 56/100 of a [175] percent in terms of compatibility, and it required us to re-engineer and do as fast as we could on a breakneck pace Release 2.01 to achieve 100 percent compatibility, because we made an awful lot of customers angry.

Q. In addition to undocumented features, was there a macro compatibility/incompatibility issue?

A. That I don't remember. But we had never had that problem since, because we pay such incredible attention to compatibility. I think we were talking about this earlier, it's the primary source of value for generation to generation.

Q. The point being that though it affected a small number of customers and was relatively inconsequential on a percentage basis, it turned out to be very consequential because it was a problem for specific customers, correct?

MR. GUTMAN: I object to the form.



A. I didn't say it affected a small amount of customers. The amount of wrath that was released as a function of that was something the company had never experienced to date.

Q. So the amount of wrath was out of proportion to the degree of incompatibility?

[176] A. I didn't say it was out of proportion to anything, it just stressed upon us from that point on the importance of 100 percent compatibility, that's the point I'm making. I wouldn't say it was out of proportion.

Q. Or as close to it as humanly possible; is that true?

A. 100 percent. I wouldn't say it's out of proportion. If customers scream all over the world about this item over and over again, it tells you it's consequential.

Q. It's important?

A. It's top-of-the-list important.

Q. One more item on this document, that footnote refers to menu changes affecting compatibility. Do you recall any discussion surrounding the development and release of Version 2.0 of menu changes other than the additional menu functions?

A. No, and I wouldn't have been involved in those discussions, that was Mitchell's purview and that's the way we ran the company at that point.

(Document marked Manzi Exhibit 7 for identification)

\* \* \*

UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS

Civil Action No: 90-11662-K

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LOTUS DEVELOPMENT CORPORATION,

*Plaintiff,*

—against—

BORLAND INTERNATIONAL, INC.,

*Defendant.*

---

DEPOSITION OF JUDITH S. OLSON, Ph. D.

Thursday, September 26, 1991

VOLUME I

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Reported by: Kimberlee Cricks, CSR# 7473

\* \* \*

[39] Q. You are being paid by somebody in connection  
[40] with your testimony here today, aren't you?

A. Yes.

Q. Who is paying you?

A. Comes through Fenwick & West.

Q. Have you had any contact with Borland directly yourself?

A. No.

Q. Talked to anyone from there? →

A. No.

Q. Any written communication with them?

A. No.

\* \* \*

[48] Q. What is your opinion?

A. I would not like to see the major aspects of user interfaces be copyrighted.

Q. Why not?

A. There is a lot of accumulated knowledge in the field that if they copyright some particular aspects of it, people have to design new things that are less good for the end user. I'm an advocate for the end user.

Q. When you say "major aspects of user interfaces," what are you talking about?

MR. GREGORIAN: Just give me a continuing objection to this line?

MR. KONRAD: Absolutely. No problem.

THE WITNESS: Major aspects of the user interface have to do with how to access the functionality, how to get the system to do what it was designed to do. That's what I mean. I would not like to see it restricted in any way. There are what I might phrase more artistic pieces to some interfaces I have seen that if they want to protect those, that's fine, like a logo.

\* \* \*

[52] Q. Well, it is certainly possible, is it not, for a software developer to design a menu tree that uses any word to represent any particular function that the program provides to the user, isn't it?

A. Say the first part of your question again.

Q. Isn't it possible for a software developer to [53] use any word at all to represent any particular function that a spreadsheet program provides to users?

MR. GREGORIAN: Object to the form. Are you talking about theoretically possible? I mean there are a million examples one can think of where can it could be done, but it would make absolutely no sense.

MR. KONRAD: Parsing that might well be an important exercise.

Q. To begin with, I do mean just as a technical matter, you could pick any word to represent any command if you wanted to, if you weren't concerned about meaning; isn't that right?

A. That is true. Technically, you can map the function to any act that the system can read.

Q. And indeed there are sensible words that differ which are used in different spreadsheet programs to represent comparable functions, aren't there?

A. There are a few.

Q. In fact, in the Quattro product, for example, the word Block is used to represent something analogous in function to Range in 1-2-3; isn't that right?

A. That's correct.

Q. In your view, is there a best or right way to design a menu tree for a spreadsheet program?

A. There are a set of well-known principles that [54] will narrow down the set of possible words and organizations.

Q. Some of those principles are just the principles of the English language and meaning; isn't that right?

A. Some selection of the word. You want to pick a word that connotes the right meaning.

Q. To that extent, your constraint is the same constraint that anyone faces when they're trying to communicate with language; isn't that true?

A. In the sense of trying to convey ideas with words, yes.

Q. Is it your view that with respect to computer software, there is such a limited number of words that make sense that if people could not use exactly the same set of words to represent different functions of a spreadsheet program, they'd be reduced to using senseless words?

A. I think there are—there's a small set of words that convey certain kinds of functions. It's not a large set. When

you're designing a whole interface, it's not just the word but the word in contrast to the other words around them, what their first letters are and how big they are. When you use all of those principles together, there's not a large set.

\* \* \*

[56] MR. KONRAD: I'm focusing on the word choice at this point.

THE WITNESS: You're asking me if there is a way to measure how large that set is. I have not personally measured it, and I am not sure—there are so many other constraints here in design of a good user interface that I think it's not an exercise that I would like to go through.

MR. KONRAD:

Q. Can you think of any example or instance where there's only one word that you believe would sensibly convey the meaning of a particular function to a user?

A. No. But I can imagine there being a very small set of words you could use if you're going to look for short, familiar, easy-to-understand words that don't conflict with the first letter of the rest of the things on a menu.

Q. Well, the point about whether they conflict with other things in the menu, I mean that raises an additional consideration, doesn't it, of how you actually organize the menu commands and what sequence you place them in, doesn't it?

A. It matters about what's on—what are the [57] competing things on the same level or whether you choose to put that one on a second level.

Q. Absolutely. And my point is that it is—strike that. I'm not here to make points: I was trying to ask a question.

Isn't it true that when you consider that question of conflicting items beginning with the same first letter on a particular menu level, the designer has the flexibility to place different commands on different menu levels to try to avoid that problem?

A. Yes.

Q. Is it technically necessary for the words—strike that. Why do the words in a particular menu level have to begin with different first letters?

A. One of the ways some pieces of software have been designed to make it easy for people to use is that they don't have to type the entire word but just the first letter. Very common principle in design of user interfaces; therefore, you want to have unique first letters so people don't have to type in the first two letters to make it unique.

Q. But it's not technically necessary that you use the first letter in the word as the one which would indicate what keystroke to type, is it?

[58] MR. GREGORIAN: When you say "technically necessary," I take it you're talking about from a computer science point of view as opposed to from a cognitive science point of view. That is, you can get the computer to respond to the command on a first letter basis or on some other basis. Is that what you're asking about? Because you go back and forth between technically necessary and computer-human interaction principles, and I want it to be clear which one you're talking about on any particular question.

MR. KONRAD: I don't like to sort of engage in this kind of thing. I'm not going back and forth between anything, any principles here or there, because it's just not what I'm doing.

MR. GREGORIAN: You're not doing that? What do you mean by "technically necessary"?

MR. KONRAD: What I meant is in the sense that that's the only way that a software program can be designed to work.

THE WITNESS: That is not the only way a piece of software can be designed to work.

MR. KONRAD:

Q. In fact, Excel, another spreadsheet program, or Windows, which is an operating system or operating environment, uses letters other than the first one in a word as the indicator of [59] which key a user should strike to invoke that command; isn't that true?

A. It is true.

\* \* \*



Q. Why is it any constraint on a developer at all, if it's true that you don't have to use the first letter in a word, that the words in a particular menu have to begin with different first letters?

A. It is easy for the user to think of the word that invokes the function and having a simple rule that says once you think of the word, type in the first letter. It's a general design prescription in our field.

Q. It may be easier for them to do, but it's not the only way to do it, is it?

[60] A. No. It's not the only way.

\* \* \*

[63] Don't those native menu trees in Quattro and Quattro Pro demonstrate that it is possible to design a new or different menu tree from an existing product that would [64] actually be better from the end user's point of view?

\* \* \*

THE WITNESS: There are aspects of the user interface of Quattro and Quattro Pro in addition to the menus and menu hierarchy that altogether make it a superior interface in my opinion. It is possible in that constellation there is a new menu tree and there are some new words.

MR. KONRAD:

Q. But you do believe that just with respect to the menu tree, the native ones in Quattro and Quattro Pro are easier to use and easier to learn than the ones in Lotus 1-2-3?

A. I do believe that.

Q. Doesn't that demonstrate that you could create a new or different menu tree from an existing product that would be better for users?

A. It is possible to build—this is a demonstration that one can be built. The question is: How many?

\* \* \*

[115] Q. Grouping menus according to that principle, you said if it's designed well—I'm just trying to—

A. There is a design prescription that says you should group things according to similar functions, and the example I just gave you of having editing things underneath the word called Edit is a reasonable—it's a good way to do things. There are a number of principles used to put together good menu design.

\* \* \*

MR. KONRAD:

Q. Right before the break, Professor Olson, you mentioned there were a number of principles for good menu design. I think we've talked about one, the grouping of items in particular menus.

What other principles do you have in mind?

A. One of them is to put frequently used commands [116] high on the menu.

Q. By "high," you mean what?

A. So that by choosing that, you don't have to make many choices before the function goes. Copy is an example.

Q. In other words, to put it on a menu towards the top of the tree rather than down in some nested subbranch?

A. As a general principle, the higher frequency ones should be higher in the menu.

Q. And others?

A. Just common words that people will recognize. And often you'd want to use short words because you're trying to save what we call screen real estate, screen space.

Q. Others that you have in mind?

A. There is a principle that you would like to match the order of what you have to choose with the goal you have in your head. For example, you often construct a sentence in your head of what you would like to do. It has verb, object, and modifier in it. That's the way you think, at least in English. And if you can—if you don't—if you can do it in that order, that's a natural order.

Q. Are you referring there, in particular, to a verb, object, modifier sequence or generally to a [117] consistent sequence of that nature? I'm not sure I understand.

A. There are two principles, and they're mixed. One is to fit the order you have in your head, and the other is to be as consistent as possible.

Q. And the order that, in your understanding, is in the English speaker's head is which again?

A. That's fitting the order which you have in your head. That's the principle. You also have another principle, which is try to be as consistent as possible.

Q. I may not be understanding. Is there a particular order in terms of verb, object, and so forth that you believe is consistently the more appropriate one?

A. There is— now these are competing principles. One says that you should use the order you have in your head, and commonly in English what you think of is verb, object, modifier. "Put that there" is an example. Okay. Now you also want to be consistent. You want— if you're going to choose an order, whichever order it is, try to keep doing that throughout. Don't mix it up. That makes people stumble.

Q. Are any of the other principles in good menu design competing in some sense?

A. There are always constraints that you have to deal with, and you can't fulfill all of these principles [118] at the same time, typically.

Q. In other words, the designer has to make some tradeoff, depending on what their objective is for the menu design?

A. Yes.

Q. This Lotus 1-2-3 uses the verb/object form of construction?

A. It is not consistent. There are some commands that do and some commands that do not.

Q. Are you familiar with the term that Ben Shneiderman uses for a kind of interface, direct manipulation interfaces?

A. I know the term.

Q. To the extent I understand that— and correct me if I'm wrong— this would refer to interfaces such as ones where you

could actually point to something on the screen and make it do something.

A. Yes.

Q. Do those interfaces operate by putting the object first and then indicating the action?

A. We have to be clear about direct manipulation interfaces because that is not a word that is— has a single definition. There are graphical interfaces for which— that are similar to this. There are icons or objects on the screen, and you move them through gestures

\* \* \*

[120] Q. You believe internally to the user, there is the same principle in application?

A. I don't know what you mean.

Q. In either case, the user is forming some mental sentence with respect to what they want to do, whether or not it's words in the menu or the manipulation of objects on the screen?

A. I believe they produce a mental sentence in their heads, and then, depending on what kind of system, they will enact.

Q. Are there any other other principles of good menu design that you have in mind?

A. There aren't any that I can think of right now. That's all.

Q. In your opinion, is there creativity in good menu design?

A. There is a lot of hard work, but it's more akin to engineering and building a bridge, given certain kinds of principles and scientific knowledge.

Q. Do you think there's any subjective quality to a menu design?

A. Well-known principles and you grind through them and have to make some judgments about tradeoffs. It's a craft.

Q. In making those tradeoffs, you don't always [121] have data available, and models and so forth can't always predict to you exactly what the appropriate choice would be; isn't that right?



A. The models and the principles cover a large domain. It's not always the case that you've got everything you need to make a choice, so you make a choice of which way you're going to do it.

Q. Making those choices, doesn't the skill and judgment of the designer come into play?

A. The skill and judgment, yes.

Q. Doesn't the intuition of the designer come into play?

A. Well, there are—if you mean by "intuition," that people have stored experiences that they can bring to bear general rules of thumb about how to do this that is brought to bear—if you mean something else by intuition, I don't know.

Q. Well, when users perceive a menu design, isn't it possible that they will simply like one better than another?

A. They will like on the basis of preference because you can learn it easier. "I understand it better. I can use it more easily when I do my work."

Q. But the user won't necessarily go through the process of articulating those reasons to explain why they [122] prefer one over the other, will they?

A. Sometimes they do. Sometimes they just say as a blanket statement, "I like this one better."

Q. When it comes to choosing words for menus that will convey the intended meaning best to the user, what engineering principle would the menu designer apply?

A. In choosing the word?

Q. Um-hm.

A. You think of the function that you want to tell the user, that "This is—This is what you can do. This is what you will get if you select this item." Then you think of the first word you think of and look up in a thesaurus for all of the other words that seem similar and make some choice based on some of the other principles.

Q. Well, in your view, is the meaning conveyed by words something that is susceptible to an engineering analysis?

A. There are analyses that say how many people recognize this word, which is the most frequent in common English. The dictionary says what it means.

Q. Well, can word choices for menus just simply be ugly or inappropriate?

MR. GREGORIAN: Object to the form.

THE WITNESS: Ugly? They can be misleading.

\* \* \*

[124] people don't like the word Abort is not because of its association with the word "abortion," but it seems like a very severe reaction, that something will be stopped and stopped very fast without regard to anything happening around it, which is frightening to some people. They think they've broken something.

Q. The word "kill," that might have the same effect?

\* \* \*

THE WITNESS: Kill is a word that people don't use anymore because some people, again, thought it was a severe reaction, not because they thought of blood and guts.

MR. KONRAD:

Q. Well, you spent a lot of time analyzing user interfaces. You've done a lot of work in it. You've worked on them yourself. Do you not think that there is any creativity in the design of the user interface?

A. I think there's a lot of smart cognition going on when you do it, what I would call human factors engineering, and I do human factors engineering. Would you say there's cognitivity in building a bridge? There's a lot of work and knowledge and skill. I'm not sure it's a creative endeavor.

\* \* \*

[125] Q. Do you have any understanding that to acknowledge there is creativity in user interface design would have some negative effect on the side you're working for in this case?

A. I think the word is a key word. That my use of the word in everyday language is very different from our use of the word in this case.

Q. Which word?



A. Creativity.

Q. How do you define creativity?

A. How do I define creativity? I don't think I have a good definition of it just off the top of my head.

Q. Well, would you say it's a creative act when somebody writes a particularly good instruction book on how to build a boat?

A. To be consistent with what I have—how I have been using it, that is a case of design and good [126] engineering principles for doing that. I teach documentation and how to do things, and it has a series of principles, and if you follow those principles, it takes no creative leap to do that. You can just grind it out, and it will be very good.

Q. Is there any creativity, in your view, in writing a software program? By that I mean to code it.

A. It depends on what the software is doing.

Q. Why would it depend on that?

A. Software for some functions that have been around for a while is not creative at all. It's hard to make sure you have all of the pieces that you need; however, there is other software coding that is very creative because you develop new algorithms. You take a leap from what you have seen before into designing something very new.

Q. Do you equate creativity with invention?

A. I don't know. Is there a technical definition of "invention"?

Q. No. Well, there might be for purposes of the patent laws, but that is not really at all what I meant. I just meant it in English usage. You just said before you create something, there would be some leap perhaps in certain coding. I'm just trying to understand your views on this point.

[127] You think that what makes that a creative thing is there was some inventive leap that the person had to make?

A. I would go along with that. There's an inventive leap. As I'm saying, if you have a technical meaning you're trying to extract here, that, I don't understand. Maybe this is normal English I'm using here.

Q. You've made that clear.

Do you think there's creativity in making a map?

A. There are standard maps, and there are inventive maps that I have seen, so it depends.

Q. Do you think there's creativity in making up icons for computer software?

MR. GREGORIAN: What do you mean "making"? Designing them?

MR. KONRAD: Designing them. I didn't want to use a word that might be loaded. I actually tried to avoid it.

Q. But in whatever it takes to make an icon that would appear as a possible selection to a user in a software program, would that be creative?

A. I can imagine, again, some of them being creative and again some of them not.

Q. What would it depend upon?

[128] MR. GREGORIAN: In her opinion?

MR. KONRAD: Right.

THE WITNESS: Well, inventive leap, a new concept where I would go "oh" as opposed to "I know what that is" and just go.

MR. KONRAD:

Q. Well, does the fact that you can apply rules to aid in better making something tend to negate, in your view, whether or not it's a creative act?

A. Making of rules? You mean that somebody is applying principles, and there are things that are known that I'm using in order to—

Q. Yes.

A. Well, to me, the more there is of that, the less creative it is. It doesn't mean it's easy because sometimes rules take you in different directions, and you have to put them together.

\* \* \*

[136] MR. KONRAD: Q. Don't you recognize that a large number of the commercially successful software products in the last ten years or so were created—or user interfaces were created without their designers following the kinds of models

or even necessarily being aware of the kinds of empirical data that you and your colleagues have been creating?

\* \* \*

[137] A. I recognize that designers do not often use models and empirical data that come out of research laboratories and still can produce successful software. They are, however, using the principles that fall from those. Though they don't recognize it comes from a scientific base, they do evolve into the general practice. Mitch Kapur talks about some of those.

Q. Yes. But you don't have any personal knowledge or belief that he was consciously following any of the models or principles that have been scientifically derived, do you?

MR. GREGORIAN: When you say "personal knowledge," do you mean to include or exclude paperwork in the case?

MR. KONRAD:

Q. Is there anything in the paperwork to suggest that he was doing that? That he was aware of any of these models and following them consciously?

[138] A. He articulates—Mitch Kapur, in his declaration, articulates general design principles about frequent things being at the top and using common words.

Q. Do you have any information to suggest that came from anything other than his own intuition?

A. He does not say where he learned that.

Q. Do you have any reason to believe he learned it from studying these kinds of books and articles?

A. I have no idea where he learned it.

Q. Aren't you, to some extent in deriving these models, simply observing the behavior of people like Mr. Kapur and trying to derive principles from what they do, in fact?

MR. GREGORIAN: Observing Mr. Kapur's behavior?

MR. KONRAD:

Q. People like Mr. Kapur who actually went out and created products, aren't you just trying to derive principles from observing what they do?

MR. GREGORIAN: Object to the form.

THE WITNESS: I don't observe what Mitch Kapur does. That's not accessible to me. I see only their end product. I evaluate their end products in the laboratory, various forms of them, and sometimes alter them myself to understand what the underlying design

\* \* \*

[173] Q. Are you familiar with anything else in any of the documentation that would suggest that a reason for the 1-2-3 emulation modes is because they provide familiar commands for users?

A. I don't remember explicitly reading that phrase a number of places.

Q. That would be an advantage in offering it, wouldn't it?

MR. GREGORIAN: What does "that" refer to?

MR. KONRAD:

Q. That having the 1-2-3 emulation modes would allow people to use commands they're already familiar with?

A. Yes.

Q. Now in your view, is it technically necessary to display the 1-2-3 menus in order to permit the execution of macros originally written in 1-2-3 in Quattro or Quattro Pro?

A. Macros that are imported have to be altered to a new situation, and to understand and debug what they are, you have to read what's on the menus. The menus do funny things.

[174] Q. When you say "You have to read the menus," you mean you have to look at the menu commands?

A. You have to look at the menu commands, and, in particular, you have to know whether after you had a carriage return, whether the menus go away and you have to start them again with a slash or whether it stays in the menu item and you just progress into the next letter or symbol that you want to invoke.

Q. Are there any particular conditions—strike that. Is what you're saying that any—strike that.

I don't understand the conditions in which you're postulating the person using the macro and needing to debug it.



What circumstance are you envisioning?

A. There's a macro that was built in Lotus that is imported to a new spreadsheet, a new situation. In that new situation, I add columns or rows or change the names of things or put other values in another cell. Macro no longer does what I expect it to do. I have to change it. Some macros were not designed to be transportable easily. They were not built very well, but they exist.

Q. Is the only way to allow people to preserve their macros, even if it's just to permit them to debug them, to display a 1-2-3 menu tree in the operation of the [175] program?

A. There are many things in the display of the menus for the purpose of debugging that are not in the manual anywhere. For example, when you invoke a particular menu item, does the menu go away or not? Once I hit a carriage return, does it go away? Some do. Some do not. Some put onto the screen the first value if you're trying to specify a range, and others do not. You have to know what it really looks like to the user who first built it in order to alter it appropriately.

MR. GREGORIAN: Can you kind of bring this to a conclusion. We passed our time. You said five minutes.

MR. KONRAD: Three more questions.

Q. Couldn't Quattro or Quattro Pro provide a translation or conversion utility for 1-2-3 macros?

A. Not if you're going to use the macro in a new situation and have to change it. There are things that appear on the screen, and there are some that involve menu picks in the middle of it that you have to have the menu items to choose from in order to do this right.

Q. But if it's translated or converted, you could then do further debugging in the new macro language, couldn't you?

A. I don't know.

[176] MR. GREGORIAN: With the exception she's noted, are you asking a general question?

MR. KONRAD: Generally.

THE WITNESS: I don't know.

MR. KONRAD:

Q. Have you ever done studies about debugging of macros and the problems people would encounter in doing that?

A. No.

Q. Have you ever studied translation or conversion of macros?

A. No.

Q. Have you ever looked at Xcel's translation ability?

A. No.

Q. Are you familiar with the command in Quattro Pro 2.0 and 3.0 called Tools Macro Key Reader?

A. I know very little about it. It will translate in the—if I understand it, it will translate some macros that were written in Lotus into the Quattro command menus.

Q. Which won't it?

A. I don't know. I know there are some.

Q. Any that you know it won't? Can you describe them.

A. I don't have an example of one that it will

\* \* \*



J.A. 734

IN THE DISTRICT COURT OF THE UNITED STATES  
DISTRICT OF MASSACHUSETTS

Civil Action  
No. 90-11662-K

---

LOTUS DEVELOPMENT CORPORATION,  
*Plaintiff,*

—vs.—

BORLAND INTERNATIONAL, INC.,  
*Defendant.*

---

DEPOSITION OF JUDITH S. OLSON, Ph.D.

VOLUME II

Taken on October 15, 1991

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APPEARANCES:

O'SULLIVAN, GRAEV & KARABELL,  
(by Kerry L. Konrad)  
30 Rockefeller Plaza,  
New York, NY 10112,  
For the Plaintiff.

FENWICK & WEST,  
(by Edmond C. Gregorian)  
2 Palo Alto Square, Suite 800,  
Palo Alto, CA 94306,  
For the Defendant.

\* \* \*

J.A. 735

[60] Q. Well, when you say that the command hierarchy of 1-2-3 is a system for performing numerical calculations, you don't mean it's some kind of mathematical algorithm for solving problems, do you?

A. The command hierarchy is not an algorithm for solving problems. It is a set of steps that you go through so you can do your work that involves numerical calculations.

\* \* \*

UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS

Case No. 90-11662-IC

---

LOTUS DEVELOPMENT CORPORATION,  
*Plaintiff,*

—Against—

BORLAND INTERNATIONAL, INC.,  
*Defendant.*

---

DEPOSITION OF JACK OSWALD  
THURSDAY, AUGUST 29, 1991  
CONFIDENTIAL—SUBJECT TO PROTECTIVE ORDER

---

Reported By: Victoria Jensen, CSR# 6393

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\* \* \*

[4] BY MR. KONRAD:

Q. Would you please state your full name and address for the record?

A. My legal name on my birth certificate is John Oswald.

Q. Do you go by Jack?

A. I go by Jack.

Q. Pretty much all the time?

A. All the time.

Q. And your address is, sir?

A. Current home address is 4750 Capitola Road, Capitola 95010.

\* \* \*

[5] Q. By whom are you employed?

A. Borland International.

Q. What is your current position there?

A. Product Marketing Manager.

Q. And is that with respect to spreadsheet products?

A. That's correct.

Q. All spreadsheet products for Borland?

A. Effectively, yes.

Q. What do you mean by "effectively?"

A. My charter is for Windows products only, but since I'm the only Product Manager, I work on all spreadsheet products.

\* \* \*

[14] Q. How long were you the Product Manager, a Product Manager for Quattro Pro?

A. What do you mean by "a Product Manager"?

Q. Well, I saw Mr. Davoust two days ago and he was a Product Manager for some period of time.

A. Okay.

Q. So, I didn't want to say the Product Manager. But were you a Product Manager—well, just for how long were you a Product Manager?

A. Since the time the product shipped?

Q. Yes.

A. I was Product Manager all the way through until I became Product Marketing Manager.

Q. In April of '91?

A. Right.

\* \* \*

[47] Q. I understand. In the presentations or conversations that you have had with the press or customers, has the subject of the 123-compatibility come up?

A. Yes.

Q. Has this been something raised by the press or customer?

A. In some cases, yes.

Q. Some cases you have raised the point?

A. Yes.

Q. What do you recall saying about that?

A. That there were four specific levels of [48] compatibility.

Q. Can you describe those?

A. Yes.

A. The main one, initial one being file compatibility, ability to load a file. The next would be macro compatibility, be able to run the macros without change; and the third would be capacity, be able—the ability to load a spreadsheet file into a similarly configured hardware machine.

Q. You mean a spreadsheet of a certain size?

A. Right. Well, not of a specific size but that a spreadsheet created on say a particular machine, in 1-2-3, there is released 2.01 or 1A could be loaded into version of Quattro Pro on that same exact machine.

Q. Okay. Exact machine. And number four?

A. And the last would be keystroke compatibility.

Q. And by that you mean specifically what?

A. The ability to load a 1-2-3 similar menu tree.

Q. And do what?

A. And be able to use similar keystrokes with that particular menu tree.

Q. Have you told people in these conversations where it comes up that Quattro Pro provides all those four levels of compatibility?

A. Yes.

\* \* \*

[54] THE WITNESS: It's hard for me to answer that question, since that was not the intention of why that point was brought up.

BY MR. KONRAD:

Q. Of why you brought up the point of keystroke compatibility?

A. Correct.

Q. What was your intention again in mentioning that separately from macro compatibility?

A. The intention was to have the product perceived prior to purchase as a product that would be easy for them to adopt, but that once purchasing the product, that they would use the new system menus in the product because they would be far easier to use and learn to accomplish tasks using spreadsheet.

Q. Would another way of putting that to be as a migration tool?

MS. OLSON: Objection. What do you mean by "migration tool"?

BY MR. KONRAD:

Q. Do you understand what I mean by that?

[55] A. You mean migration.

Q. From 1-2-3 to your product?

A. Not necessarily as a migration tool, but as a barrier to consideration of purchase, to reduce the potential barrier consideration.

Q. Aren't you saying then that you would mention that so that people would perceive that they could begin to work on your product using the menu tree that was familiar to them, even if you're hoping that they would later switch to your own menu tree?

A. That was not its intention.

Q. When you say that they would perceive it as easy to adopt, why would having a keystroke compatibility with 1-2-3 make it easy for those customers to adopt?

A. It was not a question of actually intent for the customer to use so much as a perception that there was an alternative, what was sold was benefits of the Quattro Pro and its menu and its features.

Q. But to get them to make the purchasing decision, it's an advantage to let them know that if they have doubts about the



Quattro Pro menu tree, they will be getting the 1-2-3 menu tree too.

MS. OLSON: Objection as to form. You can answer.

THE WITNESS: Could you repeat what he said.

(The record was read as follows:

\* \* \*

[56] THE WITNESS: Yes, we provided so that if they—they would perceive that if they—that they had some safe ground that they were familiar with, that the product would be familiar to them.

BY MR. KONRAD:

Q. Insofar as they were already familiar with the 1-2-3 menu tree, that's what would give them some safe ground?

A. There's more to it than that in that.

Q. Is that at least part of it?

A. That for some customers that would be true.

Q. And what else—I don't mean to cut you off, but what else would give them that safe ground?

A. That if the perception that if there was something familiar to them in the product, that the rest of the product would also be familiar, that it wouldn't be a [57] completely foreign purchase.

\* \* \*

[58] BY MR. KONRAD:

Q. How about from before then? Do you have any understanding?

A. Nothing specific, just impression.

Q. Your impression being?

A. Very, very, few.

Q. Well, in your view, would it have a negative effect on the marketing of Quattro Pro if you just took the 1-2-3 menus out?

A. Not significantly.

Q. It would have some effect?

A. I really don't know.

Q. In your view has the inclusion of the 1-2-3 menus in Quattro Pro had a positive effect on its sales?

A. I don't know if its had any effect whatsoever.

Q. Have you ever seen any studies or research or attempts to evaluate what effect the 1-2-3 menus might have had on sales of Quattro Pro?

A. I don't recall any specific studies or research.

Q. Now is it fair to say that your views on the point are based largely on the impressions you gathered

\* \* \*

[171] issue specifically from any particular customer.

BY MR. KONRAD:

Q. If you just look at the Getting Started Manual for 2.0 page 38, I'll point you right to it. It says:

"The Quattro Pro menu tree incorporates menu improvements over the Lotus 1-2-3 version 2.1 menus, but the 1-2-3 compatible menu tree is available for those who would rather use commands that they're already familiar with."

Are you aware that this was said in the manual?

A. Actually I was not aware of those particular words in the manual.

Q. Are you aware that that was ever a point made in marketing Quattro Pro that the commands that were familiar to users were there in the 1-2-3 menu tree?

A. That last statement, I believe to be correct.

Q. That point was made by Borland in selling Quattro Pro?

A. Well, you asked, I believe—could you repeat the question that he did ask?

MR. KONRAD: Yes.

(Question read.)

BY MR. KONRAD:

Q. The commands that were familiar to users were there in the 1-2-3 menu tree, that's the only way it made [172] sense,

commands that were familiar to users were there in 1-2-3 menu tree. You said I believe that statement would be correct?

A. I believe that statement is correct.

Q. And forgive me because it has been a long day, and you have been most helpful, but I need to understand that answer better. You mean that Borland did make that point in selling Quattro Pro?

A. I don't know if that was made consistently in everything that was done. In some places, it was noted that that was in fact the case.

Q. In your view was that a benefit in marketing Quattro Pro?

A. As we discussed earlier that it was based, it was used as a means to get customers, potential customers to consider purchasing the product.

Q. Fair enough. I am not going to mark it, I'm just going to show you Bates stamped 509452 through 509457. Just ask you if you have seen it before, if you haven't we'll skip it.

A. (Witness reviews document.)

Q. If you have, we'll mark it.

A. I don't remember if I specifically saw this one.

Q. Well, I'm trying to save time, but that gets

\* \* \*

UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS

Volume I  
Pages 1 to 166  
Exhibits See Index

Civil Action  
No. 87-0076-K

---

LOTUS DEVELOPMENT CORPORATION,  
*Plaintiff,*

—vs.—

PAPERBACK SOFTWARE INTERNATIONAL, et al.,  
*Defendants.*

---

Civil Action  
No. 87-0074-K

LOTUS DEVELOPMENT CORPORATION,  
*Plaintiff,*

—vs.—

MOAIC SOFTWARE, INC.,  
*Defendant.*

---

THIS TRANSCRIPT IS DEEMED CONFIDENTIAL  
PURSUANT TO COURT ORDER

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DEPOSITION OF JOHN POSNER, a witness called on behalf  
of the Defendant Paperback Software International, taken pur-  
suant to the Federal Rules of Civil Procedure, before Daniel

P. Wolfe, Registered Professional Reporter and Notary Public in and for the Commonwealth of Massachusetts, at Offices of Sherin and Lodgen, 100 Summer Street, Boston, Massachusetts, on Tuesday, March 7, 1989, commencing at 11:00 a.m.

\* \* \*

\* \* \*

[5] BY MR. GUPTA:

Q. Please state your name.

A. John Posner.

Q. Where do you live?

A. 89 Highland Circle, Wayland, Massachusetts.

Q. Are you employed?

A. Yes.

Q. Where are you employed?

A. Stellar Computer in Newton, Massachusetts.

\* \* \*

[7] Q. Would you please outline for us the positions you held upon completing your education and up to the point of your present job.

A. Immediately after I got my Master's of Education, I took a job in the math textbook department at Houghton, Mifflin Company in Boston. I stayed there from June '76 until November of '77. At that point, I got a job as a technical writer at Data General Corporation in Westborough, and so I was employed there from November '77 to February 1981. At that point I took a job with BGS Systems.

Q. Could you say that again.

A. BGS Systems in Waltham, and I was employed [8] there from February '81 through the end of 1981. At that point I resigned and became a contract technical writer and I did a few contracts during the first half of 1982. And on June 1st or—I believe it was June 1st. It perhaps was May 1st but I am fairly certain it was June 1, 1982, I started working as a contract technical writer at Lotus Development.

Q. Did there come a time when you left Lotus?

A. I left Lotus in April of 1986 and joined Stellar Computer and still work there.

\* \* \*

[9] Q. Is it correct, then, that you wrote documentation rather than code as a technical [10] writer?

MR. KONRAD: I object to the form. If you understand it, go ahead.

A. Most of my job was producing written documentation. Part of my job was producing electronic documentation, for instance, help screens, and in particular the Interactive Tutorial for 1-2-3. In the case of electronic documentation, it is—there is a fuzzy line in between writing code and writing documentation, but it would be fair to say that I write documentation, that I do not write code.

\* \* \*

[39] Q. Did you write any documentation for TRIO during the period of time that the project was known as TRIO?

A. Yes.

Q. What was that documentation?

A. I wrote—well, I am not exactly sure when the project was renamed from TRIO to 1-2-3 so that will affect my answer. I will answer it this way: During the summer and fall of 1982, I wrote substantial parts of the written documentation that eventually came out under the name *1-2-3 User's Manual*. I also wrote the scripts for the On-line Help and for the Interactive Tutorial that were eventually delivered with the program 1-2-3.

\* \* \*

[89] Did you generate any documents with respect to designing the menu structure of Symphony?

A. Yes. I generated documents which showed proposed menu structure. I would circulate that to Mitch and to other people for comments.



Q. In the course of designing the menu structure for Symphony, did you consider the menu structure of 1-2-3 to be a jumping-off point?

MR. KONRAD: I object to the form. If that term has any meaning to you, you can answer it.

A. There were a number of constraints, one of which was that Symphony had not only a spreadsheet but a word processor and a data base manager and communications capability as well. In designing the spreadsheet menu structure, I did not feel constrained to be compatible with 1-2-3's menu structure.

\* \* \*

[95] Q. Do you recall the substance of your conversation with Mr. Kapor with regard to the Symphony menu structure?

A. No. He would agree with some things I did, disagree with others. I would make the changes. It was just a boss reviewing a subordinate's work.

Q. Do you recall making any comments to him with respect to functionality in connection with putting names on features?

A. Yes.

Q. What do you recall?

A. I recall with great admiration, after having tried to figure out a good name for the function that would split a window into two windows so that they didn't overlap, after having thought about it for a few hours and not coming up with something, I brought it to Mitch and he said "Window-pane" in about five seconds, and that's what it was.

\* \* \*

[96] In designing the menu structure for Symphony, did you use at any time any document or other recording containing the menu structure for 1-2-3?

A. I am sure I consulted 1-2-3, yes.

Q. In the case of each decision you made in connection with designing the menu structure for Symphony, did you feel free to make a change with respect to a comparable word in the 1-2-3 menu structure?

MR. KONRAD: I object to the form. And I think it is a little unfair to ask somebody with [97] respect to each decision made. If you are comfortable answering that generally, I suppose you can try.

A. In general, I did feel that I could change the names of menu items and essentially the structure of the menu.

\* \* \*

Q. I will try it again. Where you did not make a change with respect to Lotus 1-2-3, was that decision not to make a change the result of work independent of 1-2-3?

[98] A. I am not sure what the question is. There was no case that I can recall where Mitch or some other person said "You can call this function AAA because it is called BBB in 1-2-3." I can't recall any case like that.

Q. Did you have a process for making the decision in connection with designing the menu structure for Symphony?

A. Just an intuitive process.

Q. What do you mean by "an intuitive process"?

A. I mean there are no a priori principles that I apply that I learned in graduate school or anything like that. There were certain constraints placed on the choices. For instance, the total number of characters can't be too great because you only have 80 characters across the screen. Each menu choice has to begin with a different letter of the alphabet. So there are various built-in constraints like that.

Q. What other constraints did you have at that time?

A. Only the pedagogical constraints of trying to be as clear as possible.

Q. Were those constraints recorded in a [99] document on a media other than paper?

A. Not that I recall, no.

Q. Did you discuss those constraints with anyone?

A. Not per se. They are just part of the business of designing a menu structure, that everybody agrees that you have to live within those—well, certainly the mandated constraints of length and uniqueness of the first letter, that's just a constraint of the program. I am sure everybody would agree with

motherhood and apple pie and clarity as being desirable. How you achieve that is not always a matter of unanimity.

Q .What do you mean by "clarity" in the context of designing the menu structure for Symphony?

MR. KONRAD: I think he told you he described the constraints of trying to be as clear as possible. "Clarity," as I understand it, is the noun form of "clear," but you can explain to Mr. Gupta.

A. When a word appears on the screen, you hope that 99 percent of the people understand immediately what that word means.

[100] Q. In terms of activating a particular command?

A. That's right. So for instance, when I mentioned before Windowpane, if you saw the command "Windowpane," you may or may not immediately be reminded of the process of dividing one window into two equal-sized windows that don't overlap. So that may or may not have been the right choice. It turned out to be the only choice that we could come up with that satisfied the constraints. For instance, I would have chosen "Window Split," but the letter "S" had already been assigned to another menu choice on that same menu, so the letter "S" was not available, so we had to find a word that didn't begin with "S." I had a hard time doing it. Mitch selected the word "pane." No one could come up with something better, so we went with it.

\* \* \*

UNITED STATES DISTRICT COURT  
DISTRICT OF MASSACHUSETTS

Volume I  
Pages 1 to 185  
Exhibits See Index

Civil Action  
No 87-0076-K

---

LOTUS DEVELOPMENT CORPORATION,  
*Plaintiff,*

—vs.—

PAPERBACK SOFTWARE INTERNATIONAL, et al.,  
*Defendants.*

---

Civil Action  
No 87-0074-K

---

LOTUS DEVELOPMENT CORPORATION,  
*Plaintiff,*

—vs.—

MOSAIC SOFTWARE, INC.,  
*Defendant.*

---

DEPOSITION OF JONATHAN M. SACHS, a witness called on behalf of the Defendant Paperback Software International, taken pursuant to the Federal Rules of Civil Procedure, before Daniel P. Wolfe, Registered Professional Reporter and Notary

Public in and for the Commonwealth of Massachusetts, at the Offices of Sherin and Lodgen, 100 Summer Street, Boston, Massachusetts, on Tuesday, November 29, 1988, commencing at 10:25 a.m.

PRESENT:

O'SULLIVAN, GRAEV & KARABELL  
(by Henry B. Gutman, Esq )  
30 Rockefeller Plaza, New York, NY 10112,  
for the Plaintiff.

\* \* \*

[154] Q. Then I will show you Exhibit No. 74. If you would begin at Page 1 and read those commands and point to the ones that fit the description that you and I were just discussing.

MR. GUTMAN: I am sorry. Which description is this?

A. Commands whose name is—

Q. Which were chosen for the same reason that you chose "Insert" and "Delete."

MR. GUTMAN: Because they provide information concerning the function? Is that the question?

Q. Do you understand the question, Mr. Sachs?

A. I think so. I would have to say every command was chosen because it suggested to some measure what the command did. The trade-off in choosing these was to pick the most informative word subject to the constraint that two words in the same menu didn't start with the same letter.

Q. Were these words the most natural words, as I believe you testified earlier, to be selected?

MR. GUTMAN: I object to the form of the question. I don't know what "most natural" means.

A. "Extract" beginning with an "X" is not

\* \* \*

IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF MASSACHUSETTS

\_\_\_\_\_  
No. 90-11662-K  
\_\_\_\_\_

LOTUS DEVELOPMENT CORPORATION,  
*Plaintiff,*

—vs.—

BORLAND INTERNATIONAL, INC.,  
*Defendant.*

\_\_\_\_\_  
The deposition of DOROTHY SCHRADER was taken on Friday, September 13, 1991, commencing at 10:00 a.m., at the Library of Congress, Madison Building, 101 Independence Avenue, S.E., Room LM407, Washington, D.C., before Susanne Q. Tate, Registered Professional Reporter and Notary Public.

\* \* \*

[24] Q. I would now like to have marked as Schrader Deposition Exhibit Number 7 a true and correct copy of a two-page letter from Phill, P-H-I-L-L, middle initial L, Gill to Stuart, middle initial P, Meyer, dated June 15, 1989, and for purposes of clarification, on this letter in the margin, I have placed a mark with a pink felt-tip pen.

(Schrader Deposition Exhibit Number 7 was marked for identification.)

BY MR. REBACK:

Q. The reporter is now placing Exhibit 7 before the witness.



Ms. Schrader, can you identify this document, Exhibit 7, as a true and correct copy of a letter from Phill Gill to Stuart Meyer sent by the Copyright Office on or about the date indicated?

A. Yes.

MR. GUTMAN: Before you go on, I'd like a moment to read it, Mr. Reback.

[25] MR. REBACK: Please. May I continue, Mr. Gutman?

MR. GUTMAN: Certainly.

BY MR. REBACK:

Q. Ms. Schrader, I call your attention to the text next to the pink mark in the margin. Do you see that, ma'am?

A. Yes.

Q. Is this the only letter that the Copyright Office has ever written with that language in it?

A. No.

Q. Is the paragraph marked with the pink mark, which for purposes of identification is the last paragraph starting on the first page and continuing on the second page, is that paragraph language that has been approved by the Copyright Office for inclusion in correspondence from examiners to applicants?

MR. GUTMAN: Object to the form.

MR. REBACK: You may answer.

MR. FARGO: Do you understand the [26] question?

THE WITNESS: Yes.

BY MR. REBACK:

Q. Can you tell us or give us your best approximation of the number of letters sent by the Copyright Office over the years that have that language in it?

MR. FARGO: I'll advise the witness she need not speculate. If she can answer the question, okay.

MR. GUTMAN: I'll object to the form.

THE WITNESS: The paragraph is a standard paragraph that is frequently included in correspondence cases relating to reg-

istration of computer screen displays. The examiner, of course, first examines the claim and determines whether this kind of comment is appropriate, but the paragraph itself is a standard paragraph that has been used many times in letters. I could really quantify the number of times.

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IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF MASSACHUSETTS

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Case No. 90-11662-K

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LOTUS DEVELOPMENT CORPORATION,  
*Plaintiff,*

—vs.—

BORLAND INTERNATIONAL, INC.,  
*Defendant.*

---

DEPOSITION OF ROBERT W. WARFIELD  
Wednesday, May 15, 1991  
VOLUME I

---

SPECIALLY CONFIDENTIAL

Reported By: Deborah A. Fryer, CSR #5191

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\* \* \*

[6] MR. KONRAD: Q. Mr. Warfield when were you born?

A. January 22, 1961.

Q. And are you in good health, sir?

A. As far as I know.

Q. Okay. Is there any physical or mental reason that would prevent you from testifying to the best of your recollection today?

A. No.

Q. Thank you, sir. By whom are you employed?

A. Borland International.

Q. For how long have you been employed by Borland?

A. Almost three years.

Q. Do you recall approximately when you started with Borland?

A. Would have been two years ago last November.

Q. November 1988?

A. Uh-huh.

Q. And what is your current position with Borland?

A. I am the Vice President/Manager of the [7] Spreadsheet and Analytical Tool Development Unit.

MR. KONRAD: Can I just hear that back.

(Record read.)

MR. KONRAD: Q. Could you tell me generally what your duties involve in that position?

A. I'm responsible for the development of spreadsheets and analytical tools.

Q. Are analytical tools, within the terminology of Borland, something different from spreadsheets?

A. In some cases.

Q. Maybe the easiest way to try to understand that is simply to ask you what published products or commercial products fall within your purview?

A. Quattro Pro.

Q. Any others at this time?

A. SideKick.

Q. Any others at this time?

A. No.

Q. And are there any products currently in development, but have not yet been released, which fall under your area of responsibility?

A. Yes.

\* \* \*

[42] Q. Let's refer specifically to Quattro Pro 1.0 or what we're calling "1.0" for now; in your own words, could you describe to me what the 123.MU file is?

A. It's a program that controls the contents of the menus and some of the messages in the product and some other miscellaneous settings and parameters.

MR. KONRAD: Could you I hear that [43] back.  
(Record read.)

MR. KONRAD: Q. When you refer to it as a "program," do you mean to say that it is a program distinct from some other parts of the Quattro Pro product?

A. Yes.

Q. And when you use the term "program," do you mean that it was written in a programming language?

A. Yes.

Q. What is that?

A. There is no name that I know of for it.

Q. How would you describe that language?

A. It's the language we use to generate our .MU files.

Q. Was this some language that was developed by Borland?

A. Not entirely.

Q. Was it also used in connection with Surpass?

A. Yes.

Q. Anywhere else that you're aware of?

A. Yes, it was also used in connection with Farsight.

Q. What was Farsight?

[44] A. Farsight was a spreadsheet product I worked on before Surpass.

Q. Who did the actual programming for the 123.MU file in the first version of the Quattro Pro?

A. Depends on which part of the file you're referring to.

Q. What different parts are you referring to?

A. The contents of the menus, some of the messages and the settings I referred to.

Q. So what you're saying is the answer would differ with respect to those different items?

A. Correct.

Q. Well, let's establish more clearly what those different things are and then I'll double-back.

When you refer to the contents of the menus, what specifically are you referring to?

A. The overall system that the commands refer to by the menus are organized in, the words that appear on the menus, the status information that appears on the menus, the long prompts for the menus, and some of the prompting details for the commands.

MR. KONRAD: Could I hear that back, please.  
(Record read.)

MR. KONRAD: Q. Could you [45] explain a little bit more what you mean by the "overall system that the commands refer to by the menus are organized in" is what she just said, can you explain exactly what you're referring to there?

A. When you use the menus you trigger certain commands, the menus are linked together under this organizational system and that's the system I'm referring to.

Q. Is a term to use for that the "menu tree"?

MR. GREGORIAN: If you know or understand that term.

THE WITNESS: So you're saying "menu tree" would refer to what?

MR. KONRAD: Q. The overall organization of the menu?

A. You could refer to it that way.

Q. As much to save words, I think I will, unless you object.

When you say the words that appear in the menus, what specifically are you talking about there?

A. There's a lot of different words that appear in the menus, there's command names, there is status information, there's shortcut information, there's symbols.

Q. Would you include within that each, well, [46] any particular menu commands such as "Worksheet," would that be a word appearing in the menus?

A. That could be a word appearing in a menu.



Q. Who was actually in charge of that part of the 123.MU file?

[47] A. That would have been me.

\* \* \*

[49] Q. Did you use the technology involved in the Menu Builder feature in order to create the 123.MU file?

A. What do you mean by "technology"?

Q. Well, I'm trying to be more general so that I don't suggest that the finished product itself was used to create the finished product, which would seem absurd. So all I'm trying to get at, though, is whether the technology that underlines that Menu Builder feature was actually something that you used yourself in creating the 123.MU file?

A. No.

Q. Did you actually sit down and write out a program to create that file?

A. I modified a program to create that file.

Q. And what program was that?

A. Well, I guess you'd call it the 123.MU program, it doesn't have a special name.

Q. Was that something that—let me back up. Was that something that was carried forward from Quattro?

A. No.

Q. At the time that you started to work on it, [50] there was already a version of the 123.MU program, is that what you're saying?

A. Yes.

Q. Do you recall approximately when you did start to work on that?

A. Well, there would have been minor changes made all during the course of development.

Q. I guess I'm looking for an initial point, if there's any way that differs from the time that you began, let's say, as a formal employee at Borland?

A. I see. Would have been in 1983, 1984.

Q. I think I'm beginning to see the light. Was the modification that you were doing to a program that you had previously worked on?

A. Yes.

Q. And that was something that had come to Borland at least directly from Surpass?

A. Yes.

Q. Had you originally written that program?

A. Yes.

Q. And in '83 or '84 was that back at Farsight?

A. That company was called Interface Technologies.

[51] Q. Which was the company that published Farsight?

A. Yes.

Q. When you did modify that program while at Borland, can you recall generally what the nature of the modifications were that you had to do?

MR. GREGORIAN: Are we talking about modifications for Quattro Pro version 1.0?

MR. KONRAD: Yes, I mean to talk, we're now at Borland, we're before Quattro Pro 1.0 is out.

MR. GREGORIAN: We've got a program that's being modified?

MR. KONRAD: Mr. Warfield said he made modifications to an earlier program he had done.

Q. And all I want to find out now is can you remember generally the nature of the modifications you made at that point?

A. Well, in general they would have been either due to changes to the syntax of that language that we made, or involving the addition of the commands that were new and unique to Quattro Pro.

Q. And when you refer to the changes in syntax of that language, you mean the programming language without a formal name?

[52] A. Correct

Q. That we talked about before?

A. Yes.

Q. Thank you. When you talk about the addition of commands unique to Quattro Pro, what are you distinguishing those commands from?

A. Commands that were in Surpass.

Q. Now, how long did you work at Surpass?

A. However long they existed, I think it was like two years, maybe a little more.

Q. Approximately 1986 through 1988?

A. Something like that, yeah.

Q. And before Surpass where did you work?

A. Interface Technologies.

Q. And approximately how long were you there?

A. About three years, maybe a little less.

Q. What was your position at Interface Technologies?

A. I held several positions.

Q. Were you a designer of the Farsight product?

A. Yes.

Q. Were you the principal designer of it?

A. What do you mean by a "principal designer"?

Q. Would you say you were in charge of its [53] development?

A. Yes.

Q. Were you the designer of its user interface?

A. Yes.

Q. The program that we have been referring to that ended up being modified to constitute the 123.MU file, how did that get from Interface to Surpass?

A. On diskette.

Q. Was it sold, was it your property, I'm just trying to —

A. Oh I see. It was sold to Surpass.

Q. I apologize if you think I ought to know this, but I don't; did Interface Technologies sell its assets to Surpass at some point?

A. Did it sell its assets? What do you mean by "assets"?

Q. Did it sell its programs, did it sell the Farsight program to Surpass?

A. Surpass acquired a technology license for Farsight.

Q. Thank you. Interface Technologies had been located where?

A. Houston, Texas.

\* \* \*

[54] MR. KONRAD: Q. Was the Farsight technology used in the development of Surpass?

A. Yes.

Q. Were you in charge of the development of the Surpass product?

A. Yes.

[55] Q. Were you responsible for the user interface design of the Surpass product?

A. Yes.

Q. Is it fair to say that the Surpass product was an evolution of the Farsight product?

MR. GREGORIAN: Object to the form, it's a little unclear I think. If you have an understanding of what he means, answer the question, but make clear what your understanding is so we don't have a miscommunication.

THE WITNESS: Let's ask, what do you mean by "evolution"?

MR. KONRAD: Q. Obviously you're in a different company, but you'd worked on Farsight, you're now working on Surpass, the technology is being used, and all I'm trying to get at is whether or not the Surpass product was built upon the Farsight product.

MR. GREGORIAN: Farsight technology?

MR. KONRAD: Q. Technology, to be more specific.

A. We used some of the technology from Farsight in the construction of Surpass.

Q. Did you redesign the user interface for [56] Surpass?

A. Some aspects of it.

Q. Which do you recall?

A. Primarily Farsight used to start up in a file manager and Surpass started up in a spreadsheet.

Q. Now, was the particular program, the one that ended up ultimately as the 123.MU file, used in the Surpass product too?

A. Yes.

Q. And that had originally been used in the Farsight product?

A. Yes.

\* \* \*

[58] Q. What was the goal in your mind for the menu system of Farsight?

A. There were a lot of goals, we wanted it to be easy to use and easy to learn, and we wanted it to be capable of executing as many Lotus-compatible macros as it could.

Q. And that last goal of allowing it to [59] execute as many Lotus-compatible macros as it could, what effect did that have on the design of the menu tree for Farsight?

A. We had to design the menus so they would behave exactly as required to satisfy that compatibility.

Q. And what does that mean?

A. If a macro executes the same keystrokes under 1-2-3 Version 1-A and Farsight, it should trigger the same command.

Q. Did they not mean that the menus of Farsight would have to provide at least the first letter for each command word identical to that from 1-2-3?

A. At least the first letter, yes.

Q. And yet in fact Farsight displayed the full word from 1-2-3, not just the first letter; correct?

A. There were full words displayed in the menus.

\* \* \*

[60] 1-2-3, were also the same as in 1-2-3; correct?

A. I believe in many cases, I'm not sure about all.

Q. In most, it's fair to say, is it not?

A. More than half.

Q. Do you recall, when you designing the interface, making an objective of finding different words that began with the same first letter?

A. No.

Q. Can you recall any particular instance where you chose a word that used the same first letter but was otherwise different from 1-2-3?

A. I believe "Worksheet," for example, may have been "WKST."

Q. Any others that you can think of?

A. Not that I recall.

Q. And in order to achieve as great a degree of macro compatibility as possible, those words for the menu commands had to be displayed within each menu in the same order; isn't that correct?

A. In the same order?

Q. Within a given menu, so that it would go Worksheet, Range, Copy, Move, as opposed to Range, Copy, Worksheet, Move.

\* \* \*

[64] Q. And with respect to the overall menu tree, with respect to those commands that were the same in Farsight as in 1-2-3, they were placed in the same groupings of menus in the same hierarchical organization, again to preserve macro compatibility; isn't that right?

A. Correct.

Q. And that portion of the program stayed the same in Farsight and Surpass and in Quattro Pro?

A. No.

Q. What changes occurred to it?

A. In Surpass we added macro compatibility with Lotus Version 2.01.

Q. And what did that involve your doing?

A. We just added some new picks to the menus.

Q. Some new what?

A. Picks, commands to the menus.

Q. When you used "pick" there you meant "p-i-c-k-s," as in new choices?

A. Correct.

(Discussion off the record.)



MR. KONRAD: Q. And those new picks or choices were commands that were new to Release 2.01 of 1-2-3; correct?

A. That's correct.

[65] Q. And you put them in the same order within the Surpass menus that they occurred in 1-2-3 Release 2; right?

A. Yes.

Q. How about with respect to Quattro Pro, did you make any changes to that part of the program when it became Quattro Pro?

A. I don't recall any.

Q. Now going back to the time that you worked on Farsight, and designing, originally designing the menu tree that ended up in Quattro Pro, how did you make sure that you had the right first letters and had the commands in the right order?

A. A lot of different ways.

Q. How?

A. We executed Lotus-compatible macros on the product, we looked at how macros were executed in Lotus.

Q. What do you mean by that?

A. I mean we executed them and observed the result that happened within Lotus as a user. We read the documentation for Lotus. Here, I keep saying "we," it's me; managers are used to saying "we."

Q. Fair enough, thank you.

A. Read books on Lotus, like by the Cobb [66] Group.

Q. When you say—anything more?

A. No.

Q. When you say "looked at how the macros executed in Lotus," you mean specifically you looked at it in operation on the screen, you don't mean you tried to get inside that?

A. We looked at it in operation on the screen.

Q. Okay. And that was specifically Lotus 1-2-3 Release 1-A at that point?

A. Yes.

Q. Regular package of it and just ran it?

A. Yes.

Q. In this program that began with Farsight, ended up in Quattro Pro, somewhere in the lines of code does the text for

the words that appear in the command menus exist actually typed out?

A. Yes.

Q. Somewhere in the code of this program there you could find the text "Worksheet"?

A. Yes.

Q. And the word "Range"?

A. Yes.

Q. And so forth through all the different commands?

[67] A. Yes.

Q. Did you actually type that in?

A. Yes.

Q. What were you looking at when you typed that in?

A. Generally I was looking at the program on the computer and a book.

Q. The program being 1-2-3 Release 1-A?

A. No, no, the program being this program that has no name that wound up being 123.MU.

Q. And the book—I understand. So that's just the programming code right there that you're working on and looking at and typing into?

A. Right.

Q. And the book is what?

A. The book would be like this one I referred to by Cobb, those kinds of things.

Q. How about the menu tree in the back of the 1-2-3 manual, did you look at that?

A. I didn't know there was a menu tree in the back of the 1-2-3 manual.

Q. Is it your recollection that at someplace in the Cobb book there is a listing of all the different 1-2-3 menu commands?

A. Don't recall.

[68] Q. Can you recall going back to 1-2-3 Release 1-A and verifying that you'd gotten the words right and in the right order?

A. Not to the program.

Q. To the documentation?

A. Yes.

Q. Any particular place in the 1-2-3 documentation that you can recall?

A. As I recall, the documentation has the commands scattered all through the manuals, so it would have been that sort of a process.

Q. And when you were typing those words in, whether you were looking at the Cobb book or some other book or the 1-2-3 documentation —

MR. GREGORIAN: Object to the form.

MR. KONRAD: Q. Well, the thrust of my question is not what you're looking at at the time.

MR. GREGORIAN: Okay. The way you prefaced it, it can be misconstrued and I'm sure that isn't your intent.

MR. KONRAD: As you know, it is not my intent ever.

MR. GREGORIAN: Okay, we're on the same wavelength then, we want a clear record and [69] that's why I objected.

MR. KONRAD: Fair enough.

Q. When you were typing in those words, regardless of whatever you may have been using to assist you in that, the intent was that the words that would be displayed in the Farsight menus would be the same as those displayed in 1-2-3 Release 1-A; is that not correct?

A. No, the intent was to achieve the macro compatibility.

Q. But you understood that the result of what you were doing typing in those words would be to cause Farsight to display the same words as those displayed in 1-2-3, didn't you?

A. Yes.

Q. Now, again, to be very specific, and Mr. Gregorian in fact does me courtesy because he knows I am just simply trying to be clear for the record, can you recall when it came time to complete that program for Quattro Pro making changes to that portion, the words, the menu setup portion of that program?

A. Sure.

Q. What changes did you make?

A. We added the new commands and stuff that we talked about.

\* \* \*

[76] Q. When you were working on Farsight, it's fair to say, isn't it, that displaying the words in macro debugging was not part of your concern since the product didn't have that ability; right?

A. No.

Q. I'm wrong?

A. You're wrong.

Q. Okay, why?

A. While we didn't have a macro debugger per se, there was a single stepping capability and there was certainly a necessity for the user to be able to debug their macros.

Q. When you say that when macros are being executed they will display the menus, I'm sure I didn't get it all down in notes, but what did you mean by that?

A. I mean it's possible that as part of the normal functioning of a macro it may display a menu that the user is supposed to make a choice from.

Q. Why do you need the full word to be displayed at that point any more then when you're not running a macro?

A. So you have some clue what the menu means.

Q. In other words, the words give you a clue as to what the choices are?

[77] A. Yes.

Q. It's because those words are conveying some information to the user about the nature of the choices the menu presents; correct?

A. Words have meaning.

Q. And the words that are displayed there have some meaning that tells you about the choices you can make at that point; correct?

A. Combination of the words and long prompts.

Q. And when it comes to debugging macros, having the full word displayed does the same thing, does it not, it gives some —



MR. GREGORIAN: What is the "same thing"?

MR. KONRAD: Q. It gives some information to the user about what the various command choices are?

A. As well as some information about what the macro is actually doing.

Q. Does it give information to the user?

A. Yes.

Q. And that's because a full word provides more information than a single letter; correct?

A. That's correct.

Q. And what did you mean, I don't mean to

\* \* \*

[78] Q. Isn't it true, though, that simply, if your objective was simply to provide the ability to execute macros previously written in 1-2-3, you wouldn't need to display the full word?

A. No.

Q. Why not?

A. Part of the process of executing a macro is that a user has to be able to successfully use the macro and make choices from these menus.

Q. Well, do you have any sense as to how many macros are written in such a way that they pause and ask the user to make some choice in the middle of its execution?

A. It's not an uncommon practice.

Q. Do you have any estimate in your mind as to how many, as to what proportion of macros are written using that?

A. No.

[79] Q. Have you ever seen any information in written form about that?

MR. GREGORIAN: About the percentage?

MR. KONRAD: Uh-huh.

THE WITNESS: No.

MR. KONRAD: Q. Have you ever heard that anyone at Borland has made any effort to try to quantify what proportion of macros actually use this practice of pausing to permit a user to make some choice?

A. No.

\* \* \*

[124] Q. How did the goal of making the product easy to learn affect the design of the user interface for Farsight?

A. It would be similar to ease of use, although somewhat extended. We would have included emphasis on the "Help" facility, and emphasis on the documentation of the product, those kinds of learning materials.

Q. Would it have affected the choice of menus and menu commands?

A. What do you mean by "would it have affected the choice of menus and menu commands"?

Q. Did the goal of making the product easy to learn affect the choice of menus and menu commands?

A. Yeah.

Q. How so?

A. Obviously we had to choose some menus that would make some sense to the user, and commands had to have terms that were, you know, understandable or familiar, usual and customary, that kind of thing.

Q. Is it fair to say that the choice of command terms and the arrangement of the menus plays a part in the user's learning of a new product?

A. Yes.

\* \* \*

[126] Q. Did you think that was within your capability at the time?

A. I don't recall having thought about it in that degree of depth.

Q. Just to try to wrap this up, at no point did you ever really try to construct a menu tree for Farsight that was non-compatible with 1-2-3?

A. Correct.

Q. Do you recall whether at that time back working on Farsight you formed any opinion as to whether the 1-2-3 menus and menu tree was the best possible menus that you could have for a spreadsheet product?



MR. GREGORIAN: You're asking for his personal opinion?

MR. KONRAD: Yes, I'm strictly asking for whether when he thought about it he formed any opinion on that idea.

MR. GREGORIAN: First did you form an opinion on that, and then his next question will be what was it.

THE WITNESS: Well, the question of what's the best possible menu tree is a difficult one, what's the best possible with respect to what?

[127] MR. KONRAD: Q. What would you want to know in order to answer that?

A. Well, I'd talked about three objectives, ease of use, ease of learning and macro compatibility; "best possible" could be different in each of those cases, for example.

Q. Well, do you recall back then at least whether you thought that if you design a menu tree from scratch, one that was fitted particularly to Farsight and what that product was going to have, you could do a better job than the 1-2-3 menu tree?

A. With respect to which one of those three goals?

Q. With respect to ease of use and ease of learning let's say.

A. Yeah, it occurred to me a better job could be done.

Q. I take it that the third objective of compatibility overrode those other two; isn't that right?

A. To some extent.

Q. I mean they are inconsistent, are they not, to some extent?

A. To some extent.

Q. Is it possible to, I mean I guess I'm [128] trying to, to me there's a logical problem, you can't be macro compatible, according to what your testimony is, and provide a completely different menu tree, isn't that right?

A. Except in the sense that Quattro Pro is capable of providing a completely different menu tree.

Q. When you say "completely different menu tree," let's make sure this is clear; are you referring to the 123.MU file or are you referring to the Quattro.MU file?

A. The Quattro.MU file.

Q. Which in your opinion is a completely different menu tree from the 123.MU file?

A. Yes.

Q. Did you work on that too?

A. Yes.

Q. Would you call yourself the designer of its user interface?

A. One of the designers.

Q. Fair enough. Would you call it a collaborative process?

A. Yes.

Q. Who were your colleagues?

A. Rob Dickerson.

\* \* \*

[150] Q. In designing the Quattro.MU menu tree for Quattro Pro, did you and Mr. Dickerson consider yourselves to have a clean slate?

A. What do you mean by a "clean slate"?

Q. Were you free to choose the menu commands that you thought were the most appropriate and organize them in the menu tree that you thought was most appropriate for Quattro Pro's functionality?

A. We were free to decide what the ground rules would be for determining that organization.

Q. Interesting answer. Could you explain what [151] you mean by the "ground rules for determining that organization"?

A. Well, we used some rules when we figured out how to lay out the menus.

Q. Can you give me—can you recall those rules?

A. Oh no, not all of them, there were a bunch of different rules.

Q. Which ones can you recall now?

A. We were seeking to create menus that would be to some degree compatible with the CUA standard, we wanted to build menus that were consistently organized, meaning similar functions were grouped together.

We wanted our menus to require as few keystrokes as possible, meaning they would be very flat. We wanted the more

common commands to be more easily accessed near the top of the menu tree.

I had another one, but it's gone. There's a lot of different rules involved in UI design, a "seven plus or minus two" rule, we wanted menus to have on average seven, plus or minus two choices, on them.

\* \* \*

[154] Q. In terms of choosing the words to represent various commands in the menu tree for the Quattro.MU file, did you and Mr. Dickerson feel yourselves constrained to pick words that were in the first version of Quattro, for example?

[155] A. Not especially.

Q. Did you feel constrained to pick words that were in the 123.MU file?

A. Not especially.

\* \* \*

[159] MR. KONRAD: Q. Yes, that's the problem.

(Record read.)

THE WITNESS: My recollection of that process doesn't extend to that level of detail.

MR. KONRAD: Q. Let's address Mr. Gregorian's point; can you recall any manner in which the 1-2-3 menu tree somehow affected the choices you had available to you in designing the Quattro menu tree, other than the proverbial "first letter of the word" problem?

A. Yes.

Q. What were those?

A. Well, in very broad terms, the two menu trees are in essence rather like filing systems for the same information.

Q. And how does that concept find articulation in the Quattro menu tree?

A. Well, it's like you had been handed some random collection of files, i.e. commands, and asked to organize them in some way, obviously the organization will have something to do with the files you've been handed.

Q. In this metaphor, what comprises a direct file?

[160] A. A command.

Q. Well, the command set for Quattro Pro was different from the 1-2-3 command set, wasn't it?

A. Different, what, meaning, what do you mean by "different"?

Q. Well, first of all, it was bigger, wasn't it?

A. It was bigger.

Q. Any idea how much bigger?

A. Well, there's lots of stuff in there that's not in 1-2-3, I don't know how to quantify that.

Q. I'm just asking whether you can. Was it 100 new commands, 200 new commands?

A. I don't know exactly.

Q. Any idea how many files, using your metaphor, how many different commands there were from 1-2-3 that were in the set handed to you?

A. Meaning from 1-2-3 the product or 123.MU?

Q. Well, let's say 1-2-3 the product—200, 300?

A. I would just have to hazard a wild guess.

Q. You really don't recall?

A. No.

\* \* \*

[165] Q. Oh that's right, absolutely. Now, when you were picking the commands, the menu commands for the Quattro.MU and how they should be arranged—let's back up, let's extend the metaphor, if possible.

Does each folder represent a single command, or in some instances is it a sequence of menu commands? Do you understand what I'm saying? Is there a folder that says "W" for "Worksheet" in the main menu, or is that folder actually /WGF fixed?

A. No, the process of designing the menus is rather like if you had a filing cabinet that could only hold however many of these things will fit on a particular menu, however you can put another filing cabinet inside, meaning you can nest down



to another menu and you go through the process again of organizing for that filing cabinet what happens.

Q. Is there a menu equivalent command for what the program does in response to just "Worksheet" on the main menu?

A. No.

Q. Now, trying to go all the way back to your first use of this metaphor, we're trying to get at how the 1-2-3 menu tree affected the Quattro menu tree in some sense, other than just avoiding the [166] first letter problem. We've tried to expand on this metaphor so maybe it's a little flush here.

Can you explain now how your image of these things as filing systems meant that your choices in the Quattro menu tree were somehow or other affected by what was in the 1-2-3 menu tree?

A. Well, we knew we wanted to be able to execute all the same commands that a macro might possibly wind up wanting to execute.

Q. A 1-2-3 macro?

A. Correct.

Q. So you wanted to make sure that there was some Quattro command in this case which could be a sequence of different menu items that would perform an analogous function?

A. The same functionality would be there.

Q. But that didn't necessarily have to be two commands or two keystrokes, whereas in 1-2-3 it was two keystrokes, it didn't necessarily have to be the same menu levels; isn't that right?

A. Well, if you mean does Quattro.MU have different numbers of keystrokes to get to these commands, yes.

Q. Right, and you can look at the menu equivalent tables and see in some instances there are [167] five in Quattro and four in 1-2-3 and probably more instances it's fewer in Quattro than in 1-2-3; right?

A. Yes.

Q. Now, did you consider how many keystrokes it took in 1-2-3 when you were trying to figure out how deep to nest the menus and how many keystrokes it would take in Quattro?

A. No.

Q. Well, what was the—maybe I'm just blocking, I'm sorry, I'm working very hard to try to understand it. How does this filing system metaphor explain what effect the 1-2-3 menu tree had on the Quattro menu tree?

A. Well, it would be if you took all the files out of the filing cabinet that was filed that way and removed all their labels and set them on the table and then said, "Okay, now, how can we re-file these so that they're easier to get to?"

Q. What would that be comparable to?

A. I'm just saying—what you said is what does this have to do with the 123.MU. I'm saying it's like you took all of those files out of that filing cabinet that had been filed in that particular manner and said—took their labels off, said okay, now let's figure out how to re-file these in a [168] different filing cabinet, Quattro.MU.

MR. GREGORIAN: Along with some other files that weren't in the original filing cabinet?

THE WITNESS: Well, I'm speaking of 123.MU.

MR. KONRAD: Q. Right, I understand, I understand. So the set of files that you already have has been determined, at least to that extent?

A. By what was in our 123.MU system.

Q. Right, that comprises a big chunk of the files you have to reorder?

A. Correct.

Q. And that's sort of what you're trying to get at, that defined a large chunk of the functionality you felt Quattro should provide?

A. It was a large chunk of the functionality we had.

Q. Fair enough, fair enough. Let's take a quick break.

(Recess.)



IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF MASSACHUSETTS

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Case No. 90-11662-K

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LOTUS DEVELOPMENT CORPORATION,  
*Plaintiff,*

—vs.—

BORLAND INTERNATIONAL, INC.,  
*Defendant.*

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DEPOSITION OF ROBERT W. WARFIELD  
Thursday, May 16, 1991  
VOLUME II

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SPECIALLY CONFIDENTIAL

Reported By: Deborah A. Fryer, CSR #5191

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[194] Q. Was there a period of time between your work for Interface and your work for Surpass?

A. Yes.

Q. How long?

A. As I recall, it was six to nine months.

Q. Trying to stay focused on the period of time that you were at Interface, did you come across any data or research discussing how many Lotus 1-2-3 users used macros?

A. I can remember one piece of research, but I don't remember if it was in that time or not, it could have been.

Q. This one piece of research is the one piece you remember of, one piece of information about how many 1-2-3 users used macros?

A. I'm sorry?

Q. You say you recall one piece of information, you don't know when it's form, all I'm trying to get at is this: Is the one piece of information you remember about how many 1-2-3 users actually used macros?

A. Oh no, I recall I think three different pieces of information.

Q. Okay, let's establish what those are and [195] then see where we can place them chronologically.

A. I think I remember having seen two different Lotus Magazine surveys of their user base, and I think one of our internal, meaning at Borland, market researchers inquired about that.

Q. Do you have any recollection as to when these Lotus Magazine surveys came out?

A. I don't.

Q. Do you recall what either of them said on that subject?

A. As I recall, the first one said something like 40 percent of users use macros and I think the second one was a little higher than that.

Q. But it's fair to say that this information was something you didn't have before you made the decision to be macro compatible?

A. That's correct.

Q. And the third piece, the Borland internal market research, you wouldn't have either obviously?

A. Right.

Q. Do you recall approximately when that piece of information reached you?

A. Sometime after Quattro Pro 1 shipped, it may have been just before Quattro Pro 2 shipped or a little bit after.

\* \* \*

[212] Mr. Konrad: Q. Mr. Warfield, it was an objective in the design of Surpass for it to be 100 percent macro compatible with 1-2-3, was it not?

A. And by "100 percent" you mean?

Q. As close to 100 percent as you could make it?

A. That's correct.

Q. And in your opinion, that meant that you not only had to provide each menu command found in 1-2-3, but also display the words for each of those menu commands in the Surpass menus; isn't that right?

A. That's correct.

Q. And it also meant, in your opinion, that you had to display those words in the same arrangement in the menus as in 1-2-3, except where you were putting additions in Surpass; right?

A. From the macro's perspective that's true, yes.

Q. And all of that was true at the time that you heard about the suit involving VP-Planner by Lotus and wondered whether Lotus might sue you too?

A. Yes.

\* \* \*

[279] MR. KONRAD: Q. Who within Borland do you think would be in the best position to judge how important the 123.MU menu tree has been to Quattro Pro's commercial success?

A. Probably the marketing and sales people.

Q. Anyone in particular?

A. Well, of course, I don't know who the best would be, I just know who I know over there.

Q. Fair enough. Turning to the Quattro.MU menu tree for a moment, do you believe that that menu tree is better suited to Quattro Pro than the 123.MU menu tree?

A. Well, earlier we had talked about three criteria for evaluating a menu tree; which one of those three are you interested in looking at?

Q. Let's make sure I understand which of the three criteria are there you're thinking of, can you give those to me again?

[280] A. Ease of use, ease of learning and macro compatibility.

Q. Well, with respect to ease of use, do you think that the Quattro.MU menu tree is better suited to Quattro Pro than the 123.MU menu tree?

A. What does "better suited to Quattro Pro" mean?

Q. Do you think it's a better menu tree for the product?

A. I think it's an easier to use menu tree for the product.

Q. And for ease of learning, do you think the Quattro.MU menu tree is better for the product?

A. Don't have an opinion on ease of learning.

Q. Why not?

A. I've never had any real opportunity to study how easy it is to learn, I wrote it so I knew it a priori.

Q. Well, did you feel when the product was done that you had done a good job in designing that menu tree?

A. Yes.

Q. Are you pleased with the result?

A. Yes.

Q. Do you think that it's a superior menu tree [281] to that from 1-2-3?

A. In the sense that it's easier to use, yes.

Q. If you were to do it again today, that is try to design the Quattro.MU menu tree, are there things you think you could do better this time?

A. Not really.

Q. Did you ever find it awkward trying to place the new Quattro Pro commands into the 123.MU menu tree?

A. No.

Q. Are there any times where you thought "We're really just sticking this in here somewhere but it doesn't really make sense within the context of the 1-2-3 menu tree"?

A. No.

Q. You felt that you found a logical place for each of the new commands within that tree?

A. I thought so.



MR. KONRAD: I'd ask the reporter to mark as Exhibit 15 a document bearing production numbers 518059 through 518065, it's entitled "Status Report on Surpass 2.0."

(Whereupon, The Above-Described Document Was Marked Plaintiff's Exhibit 15 For Identification.)

\* \* \*

[341] Q. And then you respond: "This is essentially correct." Then you give some exceptions.

Was the contemplation at this time in the summer of '88 that there were just going to be these two user interfaces?

A. That's correct.

Q. When did a decision get made to provide a third different user interface, the one that you and Mr. Dickerson designed?

A. Shortly after we completed the design for that user interface.

Q. Well, what led you to go ahead and design that new interface?

A. We thought it had potential to be a better interface and we wanted to go ahead and try and design a menu and see how we liked it.

Q. Did anyone, other than yourself and Mr. Dickerson, conclude that the new one you came up with was better and ought to be implemented?

A. Yes.

Q. Who else?

A. Most people who saw it liked it.

Q. Was it a concern when you decided to do that that you might be confusing people who were familiar with Quattro menus?

[342] A. I didn't have that concern.

Q. Why not?

A. Because I figured if they preferred the Quattro menus they could just use the Quattro menus.

Q. Well, can you recall any consideration as to what the marketing effect might be of changing the default menu tree from Quattro to Quattro Pro?

A. I don't recall any consideration of that.

Q. Can you recall what led you to think that you could create a better menu tree than that in the original Quattro?

A. I think it was just kind of my liking of the CUA style layout of such things, perhaps just coupled with the feeling that it would be an interesting exercise.

Q. Did you just not like the original Quattro menu tree?

MR. GREGORIAN: Object to the form, I think he's told you why he did it. Okay, go ahead and answer.

THE WITNESS: I was not particularly familiar with the original Quattro menu tree.

\* \* \*

[356] Q. Well, do you recall whether you in fact made any efforts in designing the Quattro Pro menu tree to not go out of your way to confuse 1-2-3 users?

A. I made every effort not to confuse anybody when I designed those menus.

Q. Fair enough. Because one of your goals was that those menus be clear and informative to as broad an audience of users as possible; correct?

A. Correct.

Q. But do you recall specifically having a concern in that regard that the different way that these menus were set up, for example, the use of object verb phrasing instead of verb object phrasing, would be particularly difficult for 1-2-3 users to learn?

A. No.

Q. In your mind there was no particular reason that a person familiar with 1-2-3 couldn't adapt and learn the new Quattro Pro menu tree as easily as they could have learned the new Quattro menu tree, I mean the original Quattro menu tree?

A. That's correct.

Q. In fact did you think that it would be possible for a 1-2-3 user to learn the new Quattro

\* \* \*



[364] MR. KONRAD: Q. Do you understand what I mean?

A. Do you mean ease of use or ease of learning?

Q. What I mean is clarity in expressing what different commands meant to the user.

A. Oh, I see. I hadn't ever really thought of the menus as expressing what commands mean.

Q. What do the words do that are used in the menus?

A. They make it easier for the user to remember how to trigger a particular command.

Q. And how do they accomplish that?

A. By typing on the keyboard.

Q. No, how do the words make it easier for the user to remember?

A. Oh, because people, when they remember commands they tend to sound things out in their heads, such as "File Open."

Q. And the words mean something when they [365] appear in the menus, don't they?

A. Yeah.

Q. Would you say it would be equally good to use the word "zebra" instead of the word "file" in a menu tree if the command that that was associated with had something to do with the filing of data?

A. Not from a standpoint of ease of learning, but possibly from a standpoint of ease of use.

Q. And why wouldn't it be good for ease of learning?

A. They wouldn't be able to infer what it did from "zebra."

Q. Because "zebra" would be illogical and senseless in that context, wouldn't it?

A. Illogical and senseless, yeah, I guess you could characterize it that way.

Q. In other words, the words that you pick to represent different commands ought to have some kind of meaning associated with what those commands do, shouldn't they?

A. Yeah.

Q. And that's something you tried to do in creating the Quattro Pro menu tree, isn't it, pick words that had some meaning to users?

A. Yeah.

[366] Q. And you wanted to be as clear in that meaning as you could be, didn't you?

A. Yes.

Q. Now, you've made reference during this deposition to all these books about user interface design, there are courses on computer users interfaces and the like, do you recognize the name Ben Schneiderman in that regard?

A. No.

Q. Never heard of him? Any books you can recall on that?

A. There's a few I recall the titles of, there was one called I think it was called Principals of Interactive Programming Environment, by Barstow. I think there was one on Designing Integrated Software by a fellow by the name of Newman, who's also famous for a graphics book by Newman and Sprowl.

There have been many articles that appeared in journals of various kinds. There's literature associated with the Apple Macintosh and accounts of what took place there and at Xerox Park. I don't remember any more specific than that.

Q. Well, is it your sense of the teaching in that field that good user interface design has nothing to do with aesthetics or subjective

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IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF MASSACHUSETTS

Case No. 90-11662-K

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LOTUS DEVELOPMENT CORPORATION,  
*Plaintiff,*

—vs.—

BORLAND INTERNATIONAL, INC.  
*Defendant.*

---

DEPOSITION OF ROBERT WARFIELD

Monday, November 9, 1992

VOLUME II

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CONFIDENTIAL—ATTORNEYS EYES ONLY  
Reported by: Kimberlee Cricks, CSR #7473

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\* \* \*

[74] Q. Are you familiar with a feature in Quattro Pro called the Key Reader?

A. Yes.

\* \* \*

[75] Q. Would you describe to me generally what that Key Reader Command is.

A. The Key Reader allows Quattro Pro to be able to execute some macros without displaying menus for the macros.

[76] Q. When you say "some macros," do you mean macros written specifically in any particular macro language?

A. Yes. These are macros written in a 1-2-3 compatible macro language.

Q. When you say "some macros," is there some way for you to identify which macros the Key Reader feature will or will not execute?

A. The Key Reader feature will execute macros that do not specifically call for the display of the menus.

Q. What types of macros call for the display of menus?

A. Macros that contain the question mark command at an appropriate point where the program would have to stop, the macro program, that is, and display a menu for the user to give a choice.

Q. Any others?

A. No. I think that's it.

\* \* \*

[80] Q. You worked on all the DOS versions of the Key Reader?

A. Yes.

Q. Did you work on the WINDOWS version of the Key Reader?

A. Yes.

\* \* \*

[83] Q. Well, whenever the feature was added, initially, who worked on its design?

[84] A. I did.

Q. Anyone else?

A. Dave Anderson.

Q. Anyone else?

A. No, I don't think so.

Q. And, initially, at least, who worked on its coding?

A. Dave Anderson.

Q. Anyone else you recall?

A. No.

Q. Do you recall who determined to include that feature in Quattro Pro?

A. That was my decision.

Q. Did you consult with anyone with respect to that decision?

A. Yes.

Q. With whom?

A. The consultation took place with attorneys present.

MR. DETKIN: You can identify the people who were there.

THE WITNESS: Philippe Kahn, Bob Kohn, Stephen Kahn, and myself.

\* \* \*

[88] all I can really comment on is that, as I mentioned in the beginning, the Key Reader does allow certain macros to be executed without having the 1-2-3 menu trees present.

MR. KONRAD: Q. Well, who had the very first idea for including such a texture in Quattro Pro?

\* \* \*

Q. Where did the first idea of doing it come from?

A. It came from me.

Q. Do you recall approximately when, in relation to the meeting that you've mentioned with Mr. Kohn and both Mr. Kahns, this idea occurred to you?

A. Sometime before.

Q. Did the idea occur to you after Lotus sued [89] Borland?

A. Difficult for me to recall. It could have been very close to the time.

Q. Well, do you recall how the idea came to you, what led you to that idea?

A. Yes. As I said, the primary reason for including the feature was to make it easy for an end user to execute compatible macros without having to change the default menu tree, and the Key Reader was simply an idea that I had to facilitate that.

\* \* \*

[94] Q. To your understanding, what was done to create the Key Reader feature?

MR. DETKIN: From the design standpoint or the coding standpoint?

MR. KONRAD: Well, let's begin with the design standpoint, which may be easier to discuss.

THE WITNESS: So are you asking, then, [95] for kind of a capsule summary of how it works?

MR. KONRAD: Q. That would be helpful. We'll see if we need to go further.

A. Basically, what we decided to do to implement the Key Reader was to include a menu structure consisting only of first letters that would be hidden entirely from view by the user. I think we have referred to that in the past as a phantom menu.

During macro execution, if the Key Reader was turned on, the macro interpreter would simply refer to those phantom menus rather than referring to the menus displayed for the user.

Q. Did you review any documents in preparation for this deposition?

A. Yes.

Q. Did you see the one piece of mail referring to the phantom 1-2-3 menu?

MR. DETKIN: I object. You're trying to invade the work product, and I instruct the witness not to answer that question.

MR. KONRAD: Q. Have you ever seen any document, Mr. Warfield, referring to something identified as the, quote, "phantom 1-2-3 [96] menu," closed quote?

A. Yes, I have.

Q. Is that what you were referring to in your answer before as the phantom menu, something that would be described as the phantom 1-2-3 menu?

MR. DETKIN: Object to the form of the question.

THE WITNESS: It's a little bit unclear what you're asking me. Could you maybe either state it again or state it differently.



MR. KONRAD: We'll move on.

Q. You said you created a menu structure that included only the first letters. Now those would be the first letters from the words in the 1-2-3 menus, correct?

A. Let me be more precise. It is not necessarily in every case a first letter. What it is, is whichever letter would be required to trigger that particular menu choice.

Q. Can you describe the circumstance in which the letter required to trigger a menu choice would not be the first letter of that menu command.

A. For example, in our default menus, you exit [97] Quattro Pro with /FX, file exit, where X is the second letter of exit.

Q. Did you create a phantom menu structure for the native or default menus?

A. No. That's just an example.

Q. Can you think of any such example in the 1-2-3 compatible menus?

A. Not off the top of my head.

Q. Did Mr. Anderson actually create this phantom menu structure?

A. Yes he did.

Q. Do you have any understanding as to how he did so?

A. I believe he did so by editing the 123.MU file.

Q. Do you have any understanding as to how he did that?

A. He would have extracted just the relevant information, which is to say the necessary pick letters and the order for those letters and the menu equivalents that needed to be executed for each of those letters.

Q. When you say "relevant information," you [98] mean the information that would be necessary in order to allow the execution of macros?

A. Yes.

Q. Would there be any other information, other than what you just mentioned, that would be necessary to allow the execution of macros?

MR. DETKIN: You're talking now about the macros that the Key Reader is capable of executing, I assume.

MR. KONRAD: Precisely.

THE WITNESS: There may be some odds and ends. I don't remember exactly, but I believe it's the pick letter and the ordering and the menu equivalents that correspond to each pick letter.

MR. KONRAD: Q. When you say "pick letter," I think that's p-i-c-k.

A. Correct.

Q. You mean the first letter of the 1-2-3 menu command, correct?

A. Not necessarily. It's the letter that triggers the particular command from the keyboard.

Q. But with respect to any command in the 123.MU file that is in 1-2-3, that's the first letter, [99] correct?

A. That's correct.

Q. And so for all of those commands, the pick letter would be the first letter, correct?

A. Yes.

Q. And are you, personally, aware of any command in the 123.MU file that is not the same as in 1-2-3 which uses something other than the first letter for its invocation?

MR. DETKIN: Object to the form of the question.

THE WITNESS: So you want to know if there's any command in the 123.MU file that is a command not present in 1-2-3 that has something other than the first letter as a pick letter.

Did I understand that correctly?

MR. KONRAD: Q. The example you gave before, I understood what you were saying. In the native or default mode, you used the file exit convention and X as the operative letter. But that is not the way that you exit the 123.MU file. And I'm asking if you can think of any example where you don't use the first letters in 123.MU for any of the new [100] commands in Quattro Pro.

A. I don't know of an example off the top of my head.

Q. That's all I was asking.

And when you say the order that you extracted, the order for those letters, you mean the order in which those commands appear in the 1-2-3 tree, correct?

A. Correct.

Q. Now when you talk about the menu equivalent commands, you're referring to something there that's unique to Quattro Pro, correct?

A. Many of them also appeared in Quattro.

Q. Fair enough. But for the record here, I want to establish just specifically what we're referring to.

In the Quattro products, you have a macro language that's referred to as the menu equivalent commands, correct?

A. Yes.

Q. Those are not menu tree specific, correct?

A. Yes.

And you can write macros using that [101] language which will execute regardless of the menu tree file that is active, correct?

A. Yes.

Q. Now you said that your understanding is that Mr. Anderson edited the 123.MU file to create this phantom menu structure.

In the version of Quattro Pro for DOS that you were working on, did the 123.MU file contain all the words from the menu commands?

MR. DETKIN: Object to the form of the question.

THE WITNESS: Can you restate it. I didn't get the question.

MR. KONRAD: Let me try it again.

MR. DETKIN: Kerry, before you do, we've been going for about an hour. Can we take a quick break?

MR. KONRAD: Can we do two minutes so I don't lose this?

MR. DETKIN: Before you answer that, let's go off the record for a second.

(Recess.)

\* \* \*

[102] it your recollection that the Key Reader feature appeared in the first version of Quattro Pro released after Lotus sued Borland?

A. My recollection was that it appeared in 3.0, which, of course, I know that wasn't the first version.

Q. I'm actually trying to just sharpen this without referring to the numbers.

Can you recall today whether it came out in the next version of Quattro Pro after Lotus sued Borland?

A. Boy, I just don't recall.

Q. Fair enough.

Do you actually recall today when Quattro Pro 2.0 came out?

A. It seems like it was something like approaching twelve months after 1.0 was shipped.

Q. That would be around the fall of 1990?

A. Yeah, I think so.

Q. Going back to where we were before the break, when Mr. Anderson edited the 123.MU file to create this phantom menu structure, did he create a new file in this process?

[103] A. Yes.

Q. What is that file called?

A. Oh, the file temporarily existed only. It got merged into QUATTRO.MU.

Q. When you say it temporarily existed, for a period of time, there was some separate file that Mr. Anderson was working on?

A. Yeah, a work file.

Q. Do you know whether that had a name or—

A. No. Don't know.

Q. Do you know whether any copy of that work file still exists?

A. Don't know.

Q. Did you ever have a copy of that file?

A. No.

Q. Did you ever see it yourself?

A. No.



Q. Did Mr. Anderson describe it to you, or are you simply assuming that such a file had to have existed?

A. I'm assuming the file had to exist.

Q. Thank you.

And for clarity sake, why would you assume [104] that such a file had to exist temporarily?

A. It just would have been the easiest way to go about editing, getting the desired end result.

Q. Recognizing that you're assuming, what would that easiest way have been to create that file?

A. To extract just the letters and menu equivalents into a separate file and then to merge that file with QUATTRO.MU. We have to get rid of all the irrelevant parts of the 123.MU file.

Q. And I think that leads perhaps better into what I was trying to get at before the break, which is an understanding of what those irrelevant parts of the 123.MU would be.

A. I see.

Q. Can you explain what parts of the 123.MU file would be irrelevant for this purpose.

A. Okay. One big part of it is that the menus themselves are divorced from being any part of any executable code. So, you see, there is no need to carry that along. There's no need to carry along the rest of the menus that would not be displayed, such as long prompts. Obviously, since we're only taking the pick letter and not the entire word, that information

\* \* \*

[112] Within the portion of the menu information section that has the phantom menu structure, do letters from 1-2-3 compatible menu commands such as WGF actually appear in that section?

A. Yes, they do.

Q. And how is the order—the appropriate order of those letters preserved within that section?

A. Well, it's—as we've discussed, it's an outline format. We've talked about this in prior depositions.

Q. Yes.

A. So they just appear in that same kind of outline format where the depth of the outline implies [113] menus leading to other menus.

Q. Well, in the deposition that we did by telephone—and I appreciate both of your efforts in that. I thought that worked very, very well. And I appreciated the professionalism that you both had in making that work—but you described the way in which you had originally written the long prompts. You described this outline format.

Is it your understanding that Mr. Anderson simply took that same piece of 123.MU and just deleted the full words?

A. That is my understanding.

Q. And that outline format that you were using at that time, when was that first created?

A. Well, that was a descendent of a file created long, long ago in the Farsight program, and it was carried forward to Surpass in Quattro.

\* \* \*

Q. Now in addition to deleting the information [114] unnecessary for running macros, did Mr. Anderson have to do something so that these would not display to the user?

A. Yes. He modified the internal workings of the product so that when they found the separator character we discussed, that it was understood that the menus would not be displayed.

Q. Well, is that some other part of the program that had to be modified other than 123.MU?

A. That's the executable—the Q.EXE program.

Q. And that's the main executable body of the program, correct?

A. Correct.

Q. What exactly happens when somebody selects Key Reader, turns that on?

A. That option tells Quattro Pro to be alert for the slash key within a macro. And if it encounters a slash, it then invokes the Key Reader to tell it after a sequence of letters which menu equivalent command should be executed.



Q. When you say it invokes the Key Reader there, you mean it goes to that section of QUATTRO.MU that contains the edited form of 123.MU that Mr. [115] Anderson created?

A. Right. As we discussed, the Key Reader is just a mapping technique that takes a sequence of letters that follow a slash and decides from that what—and tells the program from that what menu equivalent it should then execute for that particular action.

Q. I understand.

So when a user selects the Key Reader and makes that active, the Q.EXE program will recognize in running a macro that a slash key is there and will say: Go to that portion of QUATTRO.MU that Mr. Anderson created?

A. It will refer to that portion, yes.

Q. And then the program will work through that portion to find the mapping to the appropriate menu equivalent commands, correct?

A. Yes.

Q. And then it will go back out to Q.EXE to perform whatever is necessary to actually execute that, correct?

A. Correct.

\* \* \*

#### AFTERNOON SESSION

[143] MR. KONRAD: Q. Mr. Warfield, just before starting here, you came over and checked something in your Quattro Pro for WINDOWS.

Is there an answer to a previous question that you'd like to amend?

A. Quattro Pro for WINDOWS does include the Quattro Pro DOS native menus as an alternate menu you can get when you hit the slash key. So, in fact, you could execute keystroke macros written for the DOS product.

Q. You just couldn't remember that before lunch?

A. Correct.

Q. But looking at the product, you see it there, and it's refreshed your recollection?

A. Yes.

Q. That's fine.

I'd just like to go back briefly to the particular section of QUATTRO.MU that Mr. Anderson created that we were referring to before. I want to make sure that I understand exactly what that section [144] contains.

If you looked at a print-out of that section, would you see on one particular line of it a letter corresponding to a menu command from the 123.MU file and then next to it the menu equivalent command that that would correspond to?

A. That's correct.

Q. So you'd see, for example, the letter W, then a menu equivalent command on one separate line?

A. Well, of course, in that particular case, there is no menu equivalent for W, but you might see one next to the T for graph type.

Q. So you'd just see a line containing letters for those menu commands that have a menu equivalent command?

A. There are some letters that simply lead to further menus and have no menu equivalent. The case of W presents the worksheet menu. You have to go down deeper in that menu to find menu equivalents.

Q. In that case, you would see—there would be no line that had just W?

A. There would be a line that had just W, but it would contain no menu equivalents.

[145] Q. What else would be on that line?

A. There wouldn't be anything on that line. Below it would be, for instance, G for worksheet global. G is another one that leads to another menu. So there would be, for instance, G for format. You've got three lines—W, G, F—and it's on the F that contains the menu equivalent for worksheet global format.

Q. But there would be one line corresponding to each menu command in the 123.MU file?

A. I think corresponding to most of them. There may be some cases of commands not present in 1-2-3 that are also not present in the Key Reader.

Q. But for the commands present in 1-2-3, there would be a line corresponding to each?

A. To each menu equivalent, yes. That's correct.

Q. Or corresponding to each menu command?

A. Yes.

Q. And where that command had a menu equivalent, that would appear on the same line. But in some instances, there is no menu equivalent, so all you'd see is the letter?

[146] A. Correct.

Q. And, again, the order of commands, you've told me, is indicated by the outline format.

Are the subsidiary items actually indented if you were to look at a print-out?

A. Yes, they are.

MR. DETKIN: Again, we're referring to the Key Reader portion of the Quattro Pro 123.MU file?

MR. KONRAD: Right, the particular section that we talked about that Mr. Anderson did.

WITNESS: That's my assumption.

MR. KONRAD: Q. And, again, this outline format corresponds to the organization of the menu commands in the 123.MU file?

A. That's correct.

Q. Is there anything else on any one of these individual lines?

A. Not that I recall.

Q. Are these individual lines of code?

A. No, no. They're just—they're just words. It's a mapping.

Q. Is this saved as a text file?

[147] A. It's edited as a text file, but we compile it into an internal representation that's a little more compact.

Q. It is stored within QUATTRO.MU in the compiled form?

A. Yeah. Like I said, the menu equivalents are replaced by numbers, for example, rather than their text.

Q. Are the letters corresponding to menu commands converted into numbers when it's compiled?

A. No, I don't think so, although to be technical about it, the computer can choose to regard them as numbers or as letters.

Q. But to your understanding, they are not in distinction to the menu equivalent commands actually replaced by numbers?

A. That's my understanding.

Q. Now were you responsible for the development of Quattro Pro for WINDOWS?

A. Yes.

Q. And for the Key Reader feature in it?

A. I worked on the design. I was not solely responsible for the Key Reader feature.

[148] Q. Was there any redesign of the Key Reader feature for Quattro Pro for WINDOWS?

A. The concept was the same and the implementation was the same, but we didn't use the same code.

Q. Did the section that Mr. Anderson created survive into Quattro Pro for WINDOWS?

A. I believe it was further edited in order to Quattro Pro for WINDOWS.

Q. Who did that further edit?

A. Barry Spencer.

Q. Do you have any understanding of in what respect it was further edited?

A. I don't know what the exact format of that file is, but I know it is somewhat different from the file used by the DOS program.

Q. When you're referring to "format" there, what format are you talking about?

A. You know, exactly what type of punctuation would need to be used. For instance, every time there's an indentation in the DOS program, the indentation is actually not what signals the next level down to the computer. It's a parentheses that [149] does so.

Q. You're saying there's a character in the DOS version of parentheses character which is what actually signals that you're going to another level of the menu?



A. Correct.

Q. The indentation is for ease of viewing?

A. Correct.

Q. And you think perhaps the punctuation sign changed in the WINDOWS version?

A. It may have. I'm just stating I don't know exactly what the format of that file is.

Q. Is it your understanding that Mr. Spencer, whatever he may have done, worked for Mr. Anderson's section?

A. Yes.

Q. Is it your understanding that it is generally—that it contains generally the same information that the DOS version did?

A. Yes, it is.

Q. And, again, is it your understanding that whatever editing Mr. Spencer may have done was performed with it in a text format?

[150] A. Yes. I have seen the file at one point. I just don't recall the exact details of its composition.

Q. Well, of what you saw, did it still have letters on individual lines?

A. Yes.

Q. Was it still indented?

A. I begin to get hazy from there. I recall it was somewhat of an outline format. I saw it briefly when Barry demonstrated for me what he had done. I couldn't tell you any more detail than that.

Q. Do you recall any particular reason that Mr. Spencer was showing you that file?

A. Yeah. He just wanted me to be aware of what he was doing since he had discussed with me what was to be done for the Key Reader.

Q. Do you recall anything else that he told you in terms of any change to that section?

A. No. As I recall, it went something like, "Okay. I've managed to produce what we discussed," and then he showed me a demonstration similar to the one I've described that I gave.

And I said, "Okay. Good job."

\* \* \*



**Exhibits in Support of Lotus' Motion for Summary  
Judgment on Liability, filed May 7, 1991 (Declaration  
of Kerry L. Konrad (Dkt. Nos. 36 and 148)).**

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TX 1-233-501 TX 1-233-502

1983

**DERIVATIVE WORK OR COMPILATION** Complete both space 6a & 6b for a derivative work; complete only 6b for a compilation.a. Preexisting Material Identify any preexisting work or works that this work is based on or incorporates. ☐

1-2-3 Release 1A

Owner of copyrights in preexisting works

b. Material Added to this Work Give a brief, general statement of the material that has been added to this work and in which copyright is claimed. ☐

Program revised and updated; Instructional materials modified accordingly

**MANUFACTURERS AND LOCATIONS** If this is a published work consisting predominantly of nondramatic literary material in English, the law may require that the copies be manufactured in the United States or Canada for full protection. If so, the names of the manufacturers who performed certain processes, and the places where these processes were performed must be given. See instructions for details.Names of Manufacturers ☐ Eusey PressPlaces of Manufacture ☐ United States**PRODUCTION FOR USE OF BLIND OR PHYSICALLY HANDICAPPED INDIVIDUALS** A signature on this form at space 10, and a

is in one of the boxes here in space 8, constitutes a non-exclusive grant of permission to the Library of Congress to reproduce and distribute solely for the blind physically handicapped and under the conditions and limitations prescribed by the regulations of the Copyright Office: (1) copies of the work identified in space 10; application in Braille (or similar tactile symbols); or (2) phonorecords embodying a fixation of a reading of that work; or (3) both.

☐ Copies and Phonorecords☐ Copies Only☐ Phonorecords Only**DEPOSIT ACCOUNT** If the registration fee is to be charged to a Deposit Account established in the Copyright Office, give name and number of Account.Name ☐ SPENCER & FRANKAccount Number ☐

DA 0 33669

**CORRESPONDENCE** Give name and address to which correspondence about this application should be sent. Name/Address/Apt/City/State/Zip ☐

Mark Harrison c/o Spencer &amp; Frank

1111 19th Street N.W.  
Washington, D.C. 20036Area Code & Telephone Number ☐ 202 828 8000**CERTIFICATION** I, the undersigned, hereby certify that I am the☐ author☐ other copyright claimant☐ owner of exclusive right(s)I am the authorized agent of **LOTUS DEVELOPMENT CORP.** Name of author or other copyright claimant or owner of exclusive right(s) ☐

of the work identified in this application and that the statements made by me in this application are correct to the best of my knowledge.

Typed or printed name and date ☐ If this is a published work, this date must be the same as or later than the date of publication given in space 3.

MARK HARRISON

Date ☐ 11/07/85Handwritten signature (X) ☐

Mark Harrison

MAIL  
CERTIFICATE TOName ☐ Mark Harrison c/o Spencer & FrankNumber Street Apartment Number ☐

1111 19th Street N.W.

City/State/Zip ☐

Washington, D.C. 20036

-office  
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-over  
envelopeName year:  
• Completed as necessary  
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• Signed your application in space  
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• Enclosed check or money order  
for \$10 payable to Register of  
Copyrights  
• Enclosed your deposit material  
with the application and fee  
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Library of Congress, Washington,  
D.C. 20540

REMARKS: This is a true and correct copy of the application for copyright registration provided for by section 408, or in any written statement filed in connection with the application. GPO: 1984-421-278/513

GPO 1984-421-278/513

May 1984-75.000



This certificate, issued under the seal of the Copyright Office in accordance with the provisions of section 410(a) of title 17, United States Code, attests that copyright registration has been made for the work identified below. The information in this certificate has been made a part of the Copyright Office records.

OFFICIAL SEAL

REGISTER OF COPYRIGHTS  
United States of America

REGISTRATION NUMBER

TX 2 005 501

EFFECTIVE DATE OF REGISTRATION  
TXU

MARCH 23 1987  
Month Day Year

DO NOT WRITE ABOVE THIS LINE. IF YOU NEED MORE SPACE, USE A SEPARATE CONTINUATION SHEET

TITLE OF THIS WORK

1-2-3 Release 2.01 5.25" Disk Version

PREVIOUS OR ALTERNATIVE TITLES

PUBLICATION AS A CONTRIBUTION If this work was published as a contribution to a periodical, serial, or collection, give information about the collective work in which the contribution appeared. Title of Collective Work

If published in a periodical or serial give: Volume Number On Pages

NAME OF AUTHOR

a Lotus Development Corporation

Was this contribution to the work a "work made for hire"?  
☒ Yes ☐ No

OR  
Citizen of U.S.A.  
Domiciled in

## NOTE

Under the law, the "author" of a "work made for hire" is the employer (see instructions) for

NATURE OF AUTHORSHIP Briefly describe nature of the material created by this author in which copyright is claimed.

Reference Manual, Quick Reference, computer program text, audiovisual display and template text

DATES OF BIRTH AND DEATH  
Year Born Year Died

Was this contribution to the work a "work made for hire"?  
☐ Yes ☐ No

OR  
Citizen of  
Domiciled in

AUTHOR'S NATIONALITY OR DOMICILE

WAS THIS AUTHOR'S CONTRIBUTION TO THE WORK  
Anonymously? ☐ Yes ☐ No  
Pseudonymously? ☐ Yes ☐ No

If the answer to either of these questions is "Yes," see detailed instructions.

NATURE OF AUTHORSHIP Briefly describe nature of the material created by this author in which copyright is claimed.

NAME OF AUTHOR

DATES OF BIRTH AND DEATH  
Year Born Year Died

Was this contribution to the work a "work made for hire"?  
☐ Yes ☐ No

OR  
Citizen of  
Domiciled in

AUTHOR'S NATIONALITY OR DOMICILE

WAS THIS AUTHOR'S CONTRIBUTION TO THE WORK  
Anonymously? ☐ Yes ☐ No  
Pseudonymously? ☐ Yes ☐ No

If the answer to either of these questions is "Yes," see detailed instructions.

NATURE OF AUTHORSHIP Briefly describe nature of the material created by this author in which copyright is claimed.

YEAR IN WHICH CREATION OF THIS WORK WAS COMPLETED This information must be given in all cases.  
1986 4 Year in all cases.

DATE AND NATION OF FIRST PUBLICATION OF THIS PARTICULAR WORK  
Complete this information ONLY if this work has been published.  
Month Day Year U.S.A.  
11 17 1986

COPYRIGHT CLAIMANT(S) Name and address must be given even if the claimant is the same as the author given in space 2.

Lotus Development Corporation  
55 Cambridge Parkway  
Cambridge, MA 02142

TRANSFER If the claimant(s) named here in space 4 are different from the author(s) named in space 2, give a brief statement of how the claimant(s) obtained ownership of the copyright.

APPLICATION RECEIVED  
MAR 23 1987

ONE DEPOSIT RECEIVED  
MAR 23 1987

TWO DEPOSITS RECEIVED

REMITTANCE NUMBER AND DATE

MORE ON BACK

• Complete all applicable spaces (numbers 5-11) on the reverse side of this page.  
• See detailed instructions.

DO NOT WRITE HERE  
Page 1 of 2 pages



CORRESPONDENCE

☒ YesFOR  
COPYRIGHT  
OFFICE  
USE  
ONLYDEPOSIT ACCOUNT  
FUNDS USED

DO NOT WRITE ABOVE THIS LINE. IF YOU NEED MORE SPACE, USE A SEPARATE CONTINUATION SHEET.

**PREVIOUS REGISTRATION** Has registration for this work, or for an earlier version of this work, already been made in the Copyright Office?  
☒ Yes ☐ No If your answer is "Yes," why is another registration being sought? (Check appropriate box) ▼☐ This is the first published edition of a work previously registered in unpublished form.☐ This is the first application submitted by this author as copyright claimant.☒ This is a changed version of the work, as shown by space 6 on this application.

If your answer is "Yes," give: Previous Registration Number ▼ Year of Registration ▼

TX 1-694-602 1985 / TX 1-233-501, TX 1-233-502 1983

**DERIVATIVE WORK OR COMPILATION** Complete both space 6a & 6b for a derivative work; complete only 6b for a compilation.

a. Preexisting Material Identify any preexisting work or works that this work is based on or incorporates. ▼

1-2-3; 1-2-3 Release 1A; 1-2-3 Release 2

b. Material Added to This Work Give a brief, general statement of the material that has been added to this work and in which copyright is claimed. ▼  
Program revised and updated; instructional materials modified accordingly.**MANUFACTURERS AND LOCATIONS** If this is a published work consisting preponderantly of nondramatic literary material in English, the law may require that the copies be manufactured in the United States or Canada for full protection. If so, the names of the manufacturers who performed certain processes, and the places where these processes were performed must be given. See instructions for details.

Names of Manufacturers ▼

The Eusey Press

Places of Manufacture ▼

Leominster, Massachusetts, U.S.A.

The Alpine Press

Stoughton, Massachusetts, U.S.A.

**REPRODUCTION FOR USE OF BLIND OR PHYSICALLY HANDICAPPED INDIVIDUALS** A signature on this form at space 10, and a check in one of the boxes here in space 8, constitutes a non-exclusive grant of permission to the Library of Congress to reproduce and distribute solely for the blind and physically handicapped and under the conditions and limitations prescribed by the regulations of the Copyright Office: (1) copies of the work identified in space 3 of this application in Braille (or similar tactile symbols); or (2) phonorecords embodying a fixation of a reading of that work; or (3) both.a ☐ Copies and Phonorecordsb ☐ Copies Onlyc ☐ Phonorecords Only

See instructions

**DEPOSIT ACCOUNT** If the registration fee is to be charged to a Deposit Account established in the Copyright Office, give name and number of Account.

Account Number ▼

Lotus Development Corporation

DA 044210

**CORRESPONDENCE** Give name and address to which correspondence about this application should be sent. Name/Address/Apt/City/State/Zip ▼

Janis M. LaRue, Esq., c/o Lotus Development Corporation

55 Cambridge Parkway

Cambridge, MA 02142

Area Code &amp; Telephone Number ▼ (617) 577-8500

**CERTIFICATION\*** I, the undersigned, hereby certify that I am the☐ author☐ other copyright claimant☐ owner of exclusive right(s)☒ authorized agent of Lotus Development Corporation

of the work identified in this application and that the statements made

by me in this application are correct to the best of my knowledge.

Typed or printed name and date ▼ If this is a published work, this date must be the same as or later than the date of publication given in space 3.

Janis M. LaRue

date ▼ 3/20/87

Handwritten signature (X) ▼

*Janis M. LaRue*MAIL  
CERTIFI-  
CATE TO

Name ▼ Janis M. LaRue, Esq.

Lotus Development Corporation

Number/Street/Apartment Number ▼

55 Cambridge Parkway

City/State/Zip ▼

Cambridge, MA 02142

Certificate  
will be  
mailed in  
window  
envelopeName you:  
• Completed all necessary  
spaces?• Signed your application in space  
10?• Enclosed check or money order  
for \$10 payable to Register of  
Copyrights?• Enclosed your deposit material  
with the application and fee?MAIL TO: Register of Copyrights,  
Library of Congress, Washington,  
D.C. 20559

\* 17 U.S.C. § 506(e) Any person who knowingly makes a false representation of a material fact in the application for copyright registration provided for by section 409, or in any written statement filed in connection with the application, shall be fined not more than \$2,500.

\* U.S. GOVERNMENT PRINTING OFFICE: 1984: 421-278/10,000

October 1984—\$6.00



EXHIBIT 26

NEWS

For Immediate Release

*Contact*

James Strohecker  
Cunningham Communication, Inc.  
(408) 982-0400

Tami Casey  
Borland International, Inc.  
(408) 438-8400

BORLAND INTERNATIONAL ANNOUNCES  
THE GREAT AMERICAN QUATTRO UPGRADE

30-Day Offer Provides 60 Percent Off  
Spreadsheet Software to Lotus 1-2-3 Users

SCOTTS VALLEY, Calif.—October 13, 1988—Borland International, Inc. today announced a limited-time offer for its popular Quattro spreadsheet to Lotus 1-2-3 users for only \$99.95. The program, called the Great American Quattro Upgrade, requires 1-2-3 owners to send in the front cover of their user's manual and \$99.95 in exchange for the current version of Quattro. The offer is restricted to the U.S. and Canada and will run from October 7 until November 8, 1988.

"The recent delay of 1-2-3 Version 3 is a great reason for spreadsheet users to buy Quattro, and now we are giving even more incentive to upgrade, with twice the performance at a fraction of the price," said Philippe Kahn, Borland chairman, president and chief executive officer. "This gives end users an opportunity to easily and cost-effectively switch to a company that develops products on time, with demonstrated technological and price/performance advantages. We expect this promotion to stimulate even greater market interest in Quattro and heighten retail demand for the product."

The limited time offer is only available directly through Borland. Mailed requests must be postmarked before Novem-

ber 9, 1988. Customers should call the customer service line at (408) 438-8400 for further information.

Borland International, Inc. is a leading developer of high-performance microcomputer software products that match power with ease of learning and use. The Scotts Valley, Calif.-based company, founded in 1983, ranks sixth among the leading U.S. microcomputer software companies. Borland's stock is publicly traded in the United Kingdom. Borland offers some of the world's most widely used software business applications and developer's tools such as Paradox, Quattro, SideKick Plus and the Turbo Language Series.

###

Paradox, Quattro and SideKick Plus, Sprint and the Turbo Language Series are registered trademarks of Borland International, Inc.

Lotus and 1-2-3 are registered trademarks of Lotus Corporation.

## EXHIBIT 30

## N E W S

## FOR IMMEDIATE RELEASE

Contact:

Catherine Miller

Borland International, Inc.

(408) 439-1614

### BORLAND'S QUATTRO PRO WINS OVER LOTUS 1-2-3 USERS

Survey Results Indicate Exceptional Levels  
of Owner Satisfaction

SCOTTS VALLEY, Calif.—April 17, 1990—Quattro Pro from Borland International, Inc. (NASDAQ:BORL) is becoming the high-end spreadsheet of choice for many experienced spreadsheet users, according to a study conducted by Vista Marketing Research, an independent market research firm located in Oakland, Calif.

"The percentage of respondents rating the product as excellent or very good was exceptional and shows a very-high level of consumer satisfaction," said Thomas E. McCarty, president of Vista Marketing Research.

To determine attitudes about Quattro Pro, as well as upgrade and usage patterns, Vista Marketing Research mailed questionnaires to a randomly selected group of spreadsheet users who have upgraded to Quattro Pro from Lotus 1-2-3, Microsoft Excel, Computer Associates' SuperCalc, Lotus Symphony or the original Quattro. The samples were taken from groups of upgrade customers who had purchased Quattro Pro at least 60 days before the date the questionnaires were sent out. The results are based on 411 completed returns during January-March 1990.

## SUMMARY OF SURVEY FINDINGS

- \* 89% of the respondents rated Quattro Pro "Excellent" or "Very Good"
- \* 93% are continuing to use Quattro Pro
- \* 83% said they have discontinued using their previous spreadsheet and are using Quattro Pro as their sole spreadsheet program
- \* 89% were previously using Symphony or Lotus 1-2-3 (all versions)
- \* Some respondents upgraded twice—  
18% from 1-2-3 release 2.2  
10% from 1-2-3 release 3.0
- \* Quattro Pro is being used on high-end machines—  
38% reported using Quattro Pro on 386 PCs  
48% are using Quattro Pro on 286 PCs
- \* Quattro Pro is being used by experienced spreadsheet users  
36% classified themselves as "power" users  
59% said they were light/medium users  
5% of the respondents classified themselves as novice spreadsheet users

Borland International, Inc. (Scotts Valley, Calif.) is a leading developer of high performance software products, including Paradox, Quattro Pro, SideKick, Turbo Pascal, Turbo C and Turbo Debugger & Tools.

###

QUATTRO PRO® OWNER SATISFACTION  
(411 Respondents: Jan-Mar. 1990)

- 89% rated Quattro Pro "Excellent/Very Good"
- 93% continue to use Quattro Pro
- 83% claim to have discarded their previous spreadsheet
- 89% switched from a Lotus product  
(Symphony® and all versions of 1-2-3®)
- Several respondents apparently upgraded twice—  
18% switched from 1-2-3 version 2.2  
10% switched from 1-2-3 version 3.0
- Quattro Pro is used on high-end machines—  
38% use Quattro Pro on 386 PCs  
48% use Quattro Pro on 286 PCs
- Quattro Pro users are experienced spreadsheet users—  
59% Light/Medium Users  
36% Power Users  
5% Novice Users

Source: Vista Marketing Research, Oakland, CA  
(415)-839-0256

Contact: Thomas E. McCarty, President



J.A. 814

EXHIBIT C-27

CONFIDENTIAL

B O R L A N D  
1800 Green Hills Road  
Scotts Valley, CA 95067

*Try the top-rated spreadsheet.  
At a rock-bottom price.*

Offer good until  
July 30, 1990.

Marc Randolph  
Borland International  
Dept. BI634-CA  
1700 Green Hills Road  
Scotts Valley, CA 95067

Dear Spreadsheet User:

Borland International would like to make you an unprecedented offer.

- For a limited time, you can upgrade from your current spreadsheet to Borland's extraordinary QUATTRO® PRO for only \$99.95—you save \$395 off the suggested retail price.
- If you choose, we'll bill you when the program is delivered.
- You'll receive a spreadsheet that has gotten rave reviews in the computer press. *PC Magazine* said, "Seeing QUATTRO PRO in action is believing: this is the top-dog spreadsheet." And *InfoWorld* said, "This spreadsheet may just be the best available in terms of performance, capacity, (and) ease of use."

J.A. 815

- If you've been using Lotus® 1-2-3®, you'll have no learning curve. QUATTRO PRO is so compatible with 1-2-3 that you can be up and running in just 10 minutes.
- You also get a 60-day money-back guarantee. If you're not pleased with QUATTRO PRO for any reason, return it to us for a full refund.

For just \$99.95, QUATTRO PRO offers you the most important advanced features of 1-2-3 version 2.2, 1-2-3 version 3.0, Excel® and SuperCalc®—all in one program, *without requiring extensive new PC hardware*. You'll enjoy:

- *Exceptional 1-2-3 compatibility.* You can direct QUATTRO PRO to accept the same keystroke procedures, menu commands and macros as 1-2-3. And QUATTRO PRO lets you read, write and load even the largest files created with 1-2-3 Releases 1A and 2.01—*without translation*.
- *Multi-page spreadsheet consolidation.* Take any cells in the spreadsheet you're using and create "hot links" to cells in up to 64 other spreadsheets, graphs and databases—loaded *and* unloaded. This means you can reference *any* cell from *any* spreadsheet from *any* formula you're working in.

(over, please)

**Exhibit to Lotus' Motion for Summary Judgment,  
filed November 1, 1991 (Declaration of  
Paul M. O'Connor III (Dkt. No. 108))**

J.A. 817

EXHIBIT C

UNITED STATES COURT OF APPEALS  
FOR THE NINTH CIRCUIT

---

No. 89-15683

Filed Dec. 6, 1989

---

ASHTON-TATE CORPORATION, a Delaware corporation,  
Appellee/Plaintiff,

vs.

RICHARD ROSS; BRAVO TECHNOLOGIES, INC.,  
a California corporation,  
Appellants/Defendants.

---

RICHARD A. ROSS; BRAVO TECHNOLOGIES, INC.,  
a California corporation,  
Counterclaimants-Appellants,

vs.

ASHTON-TATE CORPORATION,  
and DOES ONE through FIVE,  
Counterdefendant-Appellee.

---



On Appeal from the Order of the United States  
District Court for the Northern District of California  
No. C-88-2844 DLJ

Honorable D. Lowell Jensen, District Judge

---

APPELLEE'S BRIEF

---

GARY L. REBACK  
CYNTHIA C. CANNADY  
LESLIE A. FITHIAN  
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2 Palo Alto Square, Suite 800  
Palo Alto, CA 94306  
Telephone (415)494-0600  
  
Attorneys for Appellee/Plaintiff  
ASHTON-TATE CORPORATION

---

\* \* \*

[18] features on Ross' list. Ross Depo., CR 40, at 142-43. Although Appellant's Brief repeatedly refers to the two exhibits together as constituting "a detailed layout for a major portion of the user interface of Full Impact," *see, e.g.*, App. Opening Brief at 24, it is undisputed that Ross' only "contribution" was Exhibit 8. Ross Depo., CR 40, at 103-05. Wigginton, by Ross' own admission, prepared the list and description of features identified as Exhibit 9. Ross Depo., CR 40, at 142-43.

At his deposition, Ross was asked to use colored markers to highlight those commands on his list (Exhibit 8) that are

standard Apple commands and standard spreadsheet commands. He highlighted the standard Apple commands in pink and the standard spreadsheet commands in yellow. He then admitted that the commands that remained unhighlighted on his list (Exhibit 8) are not even present in Full Impact. Ross Depo., CR 40, at 111-40. A copy of this highlighted list as it was presented to the Trial Court with an accompanying declaration, is found at Supplemental Excerpts, Tab 40, Ross Depo. Ex. 8.

Referring to this highlighted list, Ross testified as follows:

Q. You're not making any claim to the ones that are marked in pink?

A. No, not individually.

Q. You're not making any claims to the ones marked in yellow?

A. Not item by item, no.

Q. Are you making any claim that the way these things are arranged can be proprietary to you?

A. All of the menus, certainly, yes.

Q. What you think is proprietary is the way you've arranged nonproprietary commands on one piece of paper; is that correct?

A. Yes.

Ross Depo., CR 40, at 139-40.

But Ross thereafter admitted that the arrangement of the commands in Full Impact is not the same as the order in which they appear on his list, Exhibit 8, that Full Impact does not use all of the commands on his list, and

\* \* \*

[37] attaches if the requisite "originality" is found in the selection and arrangement process, *Financial Information v. Moody's Investors Service*, 231 U.S.P.Q. 803, 805, *aff'd*, 808 F.2d 204 (2d Cir. 1986), *cert. denied*, 484 U.S. 820 (1987), and in any case, the protection does not "imply any exclusive right in the preexisting material," 17 U.S.C. § 103(a), as opposed to the arrangement itself. *Harper House, supra*.

Here Ross' selection and arrangement of noncopyrightable elements was dictated largely by the Macintosh interface guidelines and standard spreadsheet commands. Wigg. Decl., CR 38, ¶ 7; Ross Decl., CR 53, ¶ 10; Ross Depo., CR 40, at 315-16. As was the case in *Financial Information*, *supra* at 805, Ross' "coordination and arrangement" consisted only of placing the uncopyrightable elements "in a uniform mold" dictated by an "externality." Accordingly, copyright "originality" is absent. *Id.*; cf. *Whelan Associates v. Jaslow Dental Laboratory, Inc.*, 797 F.2d 1222, 1237 (3d Cir. 1987).

In addition, the arrangement and selection of these commands in the Full Impact product is different from that of Ross' list. Full Impact contains commands absent from Ross' list. Ross' list contains commands absent from Full Impact. The only commands common to both are in an arrangement, order and grouping in Full Impact different from that of Ross' list. Ross Depo., CR 40, at 111-40, 315-16, 321; Wigg. Decl., CR 38, ¶ 15 & Ex. B. Even if Exhibit 8 constituted a copyrightable "compilation," which by Ross' own testimony it does not, Ross would have no interest in the pre-existing elements of the compilation as opposed to the arrangement itself. 17 U.S.C. § 103(a). Since the arrangement is admittedly different in Full Impact, Ross has no claim for relief. *See Harper House, Inc. v. Thomas Nelson, Inc.*, Nos. 87-6398, 876411. 1988 U.S. App. Lexis 16284 (9th Cir. 1989).

Finally, even if Exhibit 8 were copyrightable expression, Ross' contribution of Exhibit 8 to the MacCalc prototype would not make him a joint

\* \* \*

**Exhibits in Support of Borland's Cross-Motion for  
Summary Judgment on the Issue of Copyrightability and  
in Opposition to Lotus' Motion for Summary Judgment,  
dated January 30, 1992 (Dkt. No. 142)**



EXHIBIT 1

QUATTRO PRO HONORS: AWARDS AND QUOTES

Quattro Pro's state-of-the-art technology, innovative features, superior graphics and modern user interface have made it incredibly popular. In just over one year, Quattro Pro has earned over 30 product awards from reviewers and users worldwide. A listing of this unprecedented collection of awards is followed by an assortment of quotes pulled from various PC industry and business publications.

PC MAGAZINE

- Award for Technical Excellence, November 1989
- Editor's Choice, December 1990
- Editor's Choice, April 1990

PC MAGAZINE (UK)

- Editor's Choice, December 1990

BYTE MAGAZINE

- Award of Distinction, December 1989
- Reader's VIP Award, Spreadsheet Category, June 1990
- 1990 Award of Excellence, January 1991
- 1991 Reader's Choice Awards, Spreadsheet Category, July 1991

INFOWORLD

- Best in Its Class, January 1990
- Top 100 Products of 1989, February 1990
- Overall MS-DOS Software Product of the Year, March 1990
- Best Spreadsheet Software, March 1990
- InfoWorld Product of the Year 1990, February 1991
- Buyer's Assurance Seal, August 1991

DATAMATION

- 3rd place winner 1990 Software Products of the Year, February 1991
- Finalist 1990 Software Products of the Year, October 1990

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## PERSONAL COMPUTER MAGAZINE (PCM)—UK

- Editor's Choice, January 1990

## PC/COMPUTING

- Most Valuable Product of 1989, January 1990

## PC WEEK

- Top Score in a special spreadsheet comparison, March 1990

## PC WORLD

- Best Buy, April 1990
- 1990 World Class Award, Promising Newcomer Software, September 1990

## PC WORLD—UK

- World Class Award, Spreadsheets, December 1990

## PC WORLD—DENMARK

- Top-Rated Spreadsheet, March 1990

## PC WORLD—NEW ZEALAND

- Editor's Choice In High End Spreadsheet Comparison, October 1990

## PC USER—UK

- 1989 Software Product of the Year, April 1990
- Runner-up, Best New Program, April 1990

## SOFTWARE PUBLISHER'S ASSOCIATION (SPA)

- Best Business Application: Numeric or Data Orientation, March 1990
- Best Business Application: Numeric or Data Orientation, March 1991
- Critics Choice Award: Best Business Application Finalist, March 1991

## RESELLER MANAGEMENT

- 1990 Readers' Choice Award, October 1990

## AUSTRALIAN PERSONAL COMPUTER

- Editor's Choice, May 1990

## WHICH COMPUTER?—UK

- Best Buy Spreadsheets, October 1990

## BITS &amp; BYTES—NEW ZEALAND

- Editor's Choice, December 1989/January 1990 Special Edition
- Editor's Choice, February 1991

## MIKRODATOM—SWEDEN

- Best Spreadsheet of the Year 1990

## SYSTEMS INTEGRATION

- Applications Software Finalist, December 1990

## GOVERNMENT COMPUTER NEWS

- Top-Rated Spreadsheet, June 1990

## PC RESOURCE

- Best Numeric or Data Business Application

## ELECTRONICS TEST

- Best Spreadsheet for Engineers and Scientists, July 1990

## CPA MICRO REPORT

- 1990 CPA/MR All-Star Software, Best Spreadsheet for CPAs, July 1990

## MANAGEMENT ACCOUNTING

- Best Spreadsheet Value, November 1990

## THE CRITICS RAVE

## "BEST BUY"

"Looking for everything Excel offers (without Windows' overhead), plus full 1-2-3 compatibility? Look no further than our Best Buy, *Quattro Pro*."

PC World—April 1990

## "OVERALL MS-DOS SOFTWARE PRODUCT OF THE YEAR"

"In this year's Product of the Year ballot, InfoWorld readers chose many products that pushed the performance or technology envelope. . . . *Quattro Pro* proved that a spreadsheet could offer all the latest features and still run on an 8088-



based PC with only 512K of RAM. It includes innovative spreadsheet linking features, superior graphics, great output, and advanced database access, all organized by a modern and customizable user interface." InfoWorld—March 5, 1990

#### "BEST SPREADSHEET SOFTWARE"

"*Quattro Pro* earned our highest score among high-end spreadsheets with its combination of Excel-like and 1-2-3-like features. It works smoothly even on 640K machines—and superbly on higher-end systems. With a splashy, graphical interface and extensive features set, this is a software package with a bullet." InfoWorld—March 5, 1990

#### "AWARD FOR TECHNICAL EXCELLENCE"

"Seeing *Quattro Pro* in action is believing: this is the top-dog spreadsheet. *Quattro Pro* clearly advances the state of the art in application software with its combination of performance, feature richness, and compatibility." PC Magazine—January 16, 1990

#### "ALL STAR SOFTWARE: BEST SPREADSHEET FOR CPAS"

"*Quattro Pro* pushes 1-2-3 out of the picture. It runs well on older computers that haven't had expensive memory implants and processor transplants. Recommend it . . . for clients who won't part with old favorites." CPA Micro Report—July 1990

#### "BEST IN ITS CLASS"

"*Quattro Pro* combines many of the best elements of 1-2-3, Release 3 and Excel into one extremely powerful package, including impressive 3-D consolidation capabilities and state-of-the-art presentation-quality graphics. It's easy to use and nearly perfectly compatible with the 1-2-3 standard." InfoWorld—January 22, 1990

#### "MOST VALUABLE PRODUCT OF 1989"

". . . the 640K PC has been temporarily revived by Borland International's *Quattro Pro*. . . VROOMM (Virtual Runtime Object-Oriented Memory Management technology) allows *Quattro Pro* to work with larger spreadsheets than, say,

the memory-hungry Lotus 1-2-3 Release 3. . . and *Quattro Pro* can handle spreadsheets up to three times larger than the largest worksheet Release 3 can manage." PC/Computing—January 1990

#### "BEST SPREADSHEET FOR ENGINEERS AND SCIENTISTS"

"*Quattro Pro* is the 1-2-3 compatible spreadsheet that Lotus wishes it had introduced. It has the speed of version 2.2, the power of version 3.0, and dozens of features Lotus forgot to add to either version. Pro also has better graphics and hard copy than either Lotus program." Electronics Test—July 1990

#### TOP-RATED SPREADSHEET

"*Quattro Pro* stands head and shoulders above the rest. In the latest poll, *Quattro Pro* left the competition behind in the compatibility, speed, efficient memory use and value. Overall it out-performs the others . . ." Government Computer News—June 1990

#### "AWARD OF DISTINCTION"

"*Quattro Pro* is a joy to use. Its mouse support extends beyond simple pointing. The interface includes scroll bars and a user-programmable mouse palette . . . Once you've used a mouse for spreadsheet manipulation, you may never want to go back to your arrow keys." Byte—February, 1990

#### "AWARD OF EXCELLENCE"

*Quattro Pro* provides more features and better performance than Lotus 1-2-3 at a lower price, and yet it still runs on any DOS machine. . . . Borland provides in *Quattro Pro* a group of features not found in any single version of the market leader 1-2-3." Byte—January 1991.

#### HIGHEST SCORE IN SPREADSHEET REPORT CARD

"*Quattro Pro* demonstrates that innovation comes not only from new ideas, but also by combining existing concepts into a superior package. Borland International's entry into the



high-end market merges the best features of the two leading spreadsheets—and tosses in some improvements for good measure. . . . This spreadsheet may just be the best available in terms of performance, capacity, ease of use.”

InfoWorld—November 13, 1989

#### “EDITOR’S CHOICE”

“When all is said and done, the best spreadsheets for graphics are the best ones for everything else. . . . Borland’s Quattro Pro offers the strongest graphics of any character-based spreadsheet. . . . Quattro Pro provides a full set of charting options, drawing tools, a wealth of high-quality fonts, the ability to print graphs embedded in worksheets, and even a way to produce simple screen-show presentations—all in a package that works well under DOS on ordinary PCs. . . . If you need excellent graphics . . . this is the place to go.”

PC Magazine—December, 1990

#### AWARD FOR TECHNICAL EXCELLENCE

“You get a better spread of functionality in *Quattro Pro* than you find in Lotus 1-2-3 release 2.2 or even release 3. *Quattro Pro* delivers a workable variety of three-dimensionality, a publishing capability and a whole lot of other goodies in a single package that benefits from high-spec hardware without absolutely requiring it.”

PC Magazine—December 1989

#### BEST SPREADSHEET VALUE

“. . . *Quattro Pro* is a powerful contender for best all-around spreadsheet, rivaling both Lotus 1-2-3, version 3, and Microsoft’s Excel. . . . It’s flexibility and power make it a superior choice for business, education, or personal use.”

Management Accounting—November 1990

#### EXHIBIT 6

LIBRARY OF CONGRESS  
COPYRIGHT OFFICE  
Washington D.C. 20559

January 20, 1987

O’Sullivan Graev & Karabell  
30 Rockefeller Plaza  
New York, New York 10112

Attention: Kerry L. Konrad

RE: 1-2-3 SCREENS, RELEASE 1 AND 1-2-3 SCREENS,  
RELEASE 2 submitted on behalf of Lotus Development  
Corporation

Dear Mr. Konrad:

We have received your applications for registration of copyright claims in these works. In space 2 of the applications you describe the authorship as “Visual display/computer graphics.” In space 3 of the applications you show that a previous registration has been made for each work and that the purpose of the present applications is “To obtain additional protection of VA copyright for visual element of work.”

It is the position of the Copyright Office that textual screen displays embodied within the computer program that generates them are covered by the registration for the program, without either the need or justification for separate registration for the displays. Because the displays are considered to be an integral part of the program, the authorship in the displays appears to be the same as that contained in the program. Moreover, the Copyright Office would not register a claim in the format or layout.

J.A. 828

We are, therefore, filing the applications without further action. The fees are non-refundable.

Sincerely yours,

/s/ JULIA B. HUFF  
Julia B. Huff  
Supervisory Copyright Examiner  
Visual Arts Section  
Examining Division

J.A. 829

EXHIBIT 9

LOTUS™ 123

USER'S MANUAL

For the IBM® Personal Computer and the COMPAQ™  
Portable Computer

\* \* \*

## [60] COMMANDS

### Using Menus

One of the cardinal principles of the computer world is:

*The more characters you type, the greater your chances of making a mistake.*

And one of the main questions asked by users of computer programs is:

*What do I do next?*

In recognition of both these points, 1-2-3 relies heavily on **menus** to handle its communication with you. A menu is simply a list displayed in the control panel that informs you of your options and lets you select one of them. Menus play a role in several 1-2-3 command situations (figure 33).

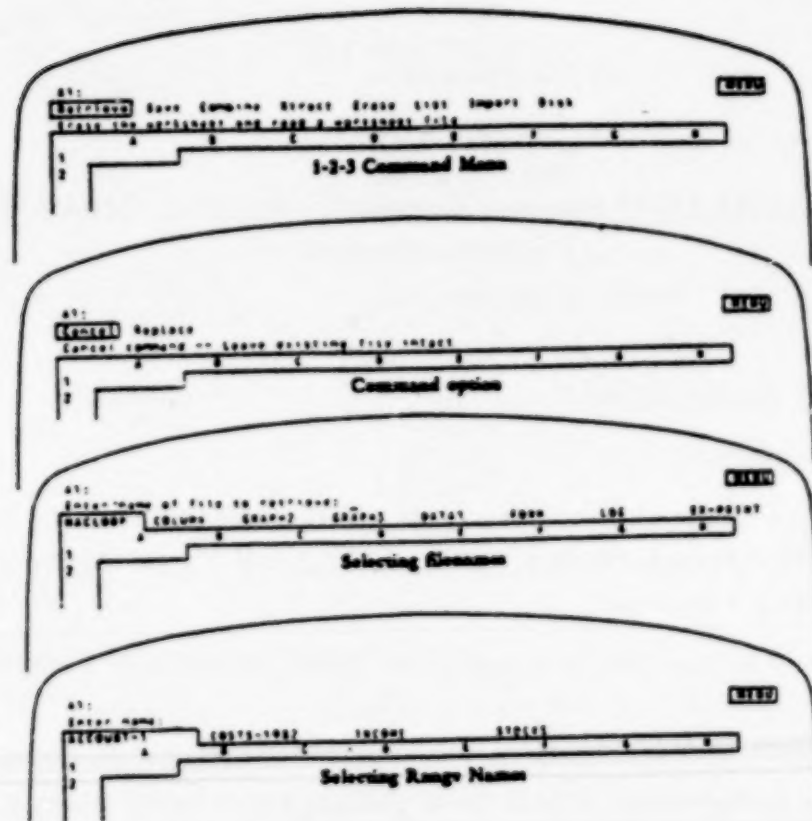


Figure 33. Types of Menus

In some cases, the list of options is complete. When 1-2-3 shows you a list of command keywords, for example, that's all there is. You must select one of these keywords in order to proceed with the command.

## EXHIBIT 14

CONFIDENTIAL

## INTEROPERABILITY QUALITATIVE STUDY

August, 1988

MRD #212

Prepared by:

Linda Christle  
Marketing Research Department

In Collaboration With:

Sunday Lewis  
Techvantage, Inc.

Research conducted:

August, 1988

## [iv] SUMMARY OF FINDINGS

*Participants*

- It was difficult to find MIS/InfoCenter Managers who supported both IBM PC and Macintosh environments.
- End user participants found the subject area extremely difficult to discuss.

*Environmental Issues*

- In those environments where PCs and Macs exist, both platforms will grow in use. Those shops that are predominantly one platform or another have a tendency to want to maintain one predominant platform.



- The majority of firms have software standards lists which have been relaxed in recent months because of user demands. 1-2-3 and Mac Excel are the predominant spreadsheets; however, PC Excel is gradually being accepted as an alternative standard for some applications.
- OS/2 and PM hold promise but most participants will remain skeptical until application software that clearly demonstrates the benefits in switching is available.
- Mac users are considered different from the rest of an organization. Either they are in marketing, where desktop publishing is critical, or they are "academics."

#### *User Interfaces*

- Interoperability is not a commonly used term. However, as the discussion unfolded, participants redefined interoperability to mean cross platform data/file sharing and macro compatibility, and (to a much lesser extent) cross platform user interface.
- "1-2-3-ness" is not as easily identified as "Mac-ness." When probed, 1-2-3 meant a structured command set, row and column grids, and (/). Mac features were more easily defined: icon-driven, easy to use, mouse-driven, outstanding graphics and a consistent user interface across different software products.
- The 1-2-3 user interface is considered familiar and functional—a "workhorse." Most considered it the best UI at the time of its announcement, but less so today. It was not considered elegant.

\* \* \*

[4] "The Macs are used by Marketing people who crank out brochures and a lot of graphics and by our Planning group who is constantly cranking out proposals . . ."

"We use ours for desktop publishing."

"Almost all of ours are used for Desktop Publishing."

"Info Resources."

"Budgeting, planning, presentations and in-house SW development."

#### *Mac users fall into definite categories.*

Attendees reported a definite difference between Mac and PC users. However, the difference was not so much in job responsibility but in personality types and attitudes . . .

"Academic types use Macs."

"Mac people are the sweater and jeans type rather than the 3-piece suit type."

"Our Mac users tend to be very demanding of what our systems can give them, much more so than IBM users."

"Mac users are very loyal. More than likely they picked the MAC, it wasn't given to them. More than likely they're hackers."

#### *PC users overwhelmingly use 1-2-3.*

The vast majority of PC users had chosen 1-2-3 as their spreadsheet. That decision was made when 1-2-3 first came out and was obviously far superior to VisiCalc. This strong base perpetuated sales/use of 1-2-3 and is the reason for 1-2-3's success today . . .

"Everyone I work with uses 1-2-3."

"When 1-2-3 came out you thought it was great because there was nothing to compare it to but VisiCalc."

"When it first came out it was like WOW!, this is pretty neat."

"There's a certain amount of momentum there because people already know how to use 1-2-3 and it does the job for them. These people don't even look to switch. There is also

a tremendous momentum to keep 1-2-3 so as not to have to reinvest in training. That's one of the things that keeps products where they are—the investment in training.”

\* \* \*

[14] “The concept (of a language for experienced application developers) is not appealing. Lotus should be more for the end-user.”

*The common interface is somewhat important but data/macro compatibility is more important.*

The consensus here is that data/macro capability is the most important item. Attendees were willing to give up a little on the UI for the data/macro compatibility . . .

“All Lotus products should have data/macro compatibility. That's real important and the UI may have to be sacrificed a little for that.”

“Compatibility is the most important thing. If the UI is so important to you—you buy a Mac.”

“We have an awful lot of remote users that feed in financial information. We can't expect them all to go up to OS/2, so there are still going to be old PCs. We can't ask the remote users to make a commitment to new hardware and new software. So, they're going to have to have data sharing and macro compatibility. I want data sharing and macro compatibility over everything else.”

“. . . if the data is incompatible, then as far as I'm concerned, it's useless. If I have to go changing everything; we may have 2,000-3,000 programs floating around. If they all have to be changed, then I'm not going to buy the product.”

*The users are comfortable with 1-2-3's UI and are pleased with its ability to help them do their job.*

On the whole, 1-2-3 users related well to the 1-2-3 UI. They are comfortable with it from so many years of use and appreciate the fact that 1-2-3 helps them get out the work when they really need to. Although praised for its functionality, they agreed that the UI was no longer “elegant.”

“At one time it was [elegant], but not anymore. I think when it first came out it was like WOW!, this is pretty neat.”

“One of the great things that's always been about Lotus is that it's a ‘workhorse.’ It ain't pretty but it does the same thing everyday. It does the job everyday with a consistency across generations. Everybody's starting to add bells & whistles to spreadsheets making them something they're not. I think the vendor community has to start

\* \* \*

[15] *Each platform's spreadsheet should be optimized for its own environment.*

Each platform's spreadsheet product should contain all of the features necessary to make it competitive in its own environment. However, a core set of features across platforms should be retained.

“There should be a baseline, a core set of functions across all. Those would be the most used functions. Extensions are something we all live with.”

“I'm not desperately worried about every function. I'm worried about core functions working, /FILE RETRIEVE working on both of them. But, if there are special functions that are key to my VM environment, I'm not worried that they should be exactly duplicated.”

“The old functions have to be your new base functions. Then you build on them, so that your old program works on the new system. That has to be.”

*Attendees are in agreement that macro compatibility is KEY.*

Participants felt it was important to preserve the time spent developing macros. They considered macro compatibility critical, no matter what version they were working with . . .

"The key is to be able to bring what we've already got forward, even though it may look a little different. The data and macros should come forward so that the users can be operational within minutes of installing."

"If you're going to move programs and data back and forth you also want to move the whole spreadsheet back and forth which would include any macros you had."

"We expect macro compatibility."

## EXHIBIT 15

Europäisches Patentamt  
European Patent Office  
Office européen des brevets

Publication number: 0 428 261 A2

## EUROPEAN PATENT APPLICATION

Application number: 90310897.5

Date of filing: 04.10.90

Int. Cl.<sup>5</sup>: G06F 3/033

Priority: 13.11.89 US 436517

Date of publication of application:  
22.05.91 Bulletin 91/21

Designated Contracting States:

AT BE CH DE DK ES FR GB GR IT LI LU NL SE

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Representative:

Blatchford, William Michael et al  
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Computer user interface.

A computer user interface that comprises a system and methods to provide a control hierarchy, control marking, a hybrid grammar, and resized and/or repositioned dialog boxes. Control hierarchy divides controls, assigns each control a label, displays the labels according to a design hierarchy, and operates on the controls according to a functional hierarchy. Control marking distinguishes controls, via addition of graphic elements or changes in labels—referred to as glyphs. Hybrid grammar simultaneously allows a user to specify operations and data objects in a noun verb relationship or verb noun relationship. Finally, resized and/or repositioned dialog boxes enable a user to select a control that requires selection of data objects that are possibly obscured by the dialog box.

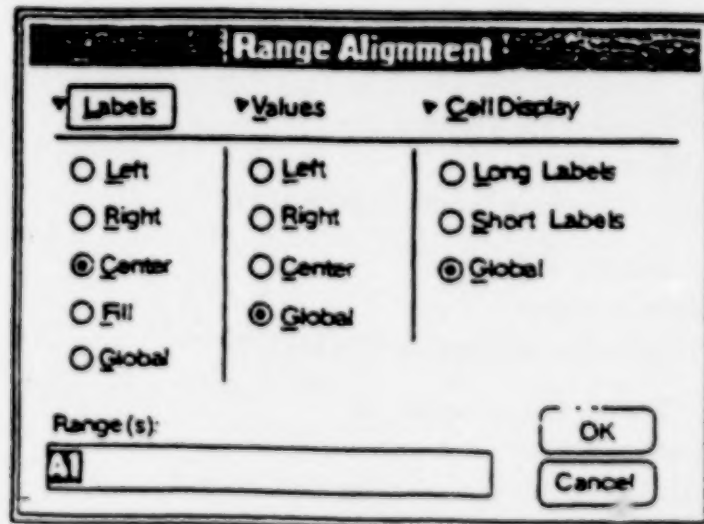


FIG 1

\* \* \*

[9] Before and after the messages reach or are sent to the application 14, however, the HDBM filters the messages from the OS/WM 12 so that both the application 14 and the OS/WM 12 receive only relevant messages. For example, HDBM might use an initialization message sent from the OS/WM 12 to autoposition the dialog window to an area of the screen when the window becomes visible.

The HDBM is an extension of the window manager in OS/WM 12. The window manager, e.g., presentation Manager®, has its own dialog box manager. However, HDBM supports the hierarchical keystroke mnemonics described above in connection with Control Hierarchy and Control Marking. In addition, the HDBM provides access to a group of control windows contained within the dialog box that are not part of the hierarchy, e.g., "OK" and "Cancel" controls and fully maintains the standard presentation manager mouse selection and pointing conventions for dialog boxes.

Referring again to Fig. 6, note that the HDBM is divided into two parts, namely the Front End Filter 18 and the Back End Filter 20. The Front End Filter 18 filters the messages from the OS/WM 12, routes or translates if necessary the relevant messages for the application 14, and then passes the messages to the application.

At run-time, the HDBM dialog box loader 13 captures and uses the parent/child arrangement of the controls specified in the definitions file 16 to graph the hierarchy of the dialog box so the HDBM can "navigate" between controls, i.e., move from one group of controls to another in proper sequence and move from one control to another within a group. Once the HDBM dialog box loader 13 has captured the hierarchical relationship between the controls, it "flattens" the dialog box window by making all the controls within the window children of the dialog window. This is done to simplify the message protocol imposed by the window manager 12 and controlled by the application 14 when creating and/or processing the dialog box.

Next, the application 14 filters and translates the messages it receives from the Front End Filter 18. The application 14, based on the definitions of the dialog box window and control windows in the definition file 16, executes any application specific operations on the affected control window and dialog box window. For example, the application 14 might validate text in a edit control box.

Next, the application 14 passes any messages that are not relevant, e.g., OS/WM primitive operations to the Back End Filter 20. The Back End Filter 20 filters the messages and executes hierarchical operations. For example, if the selection of one control makes it impossible to select a second [10] control, the Back End Filter 20 removes a glyph from the second control. Finally, the Back End Filter 20 passes the messages to the OS/WM 12 for any default processing that may be needed.

In addition, the HDBM fields all mouse events and keystroke events while the dialog box is active. If a control "window that supports selection outside the dialog box has the input focus, a mouse event or certain keystroke events cause the dialog box to be resized and/or repositioned as described above, when the events indicating that the selection has been completed are received by the HDBM, the dialog box is restored to its original size and position. The resizing and repositioning is a low priority activity so that if the events indicating the selection have been completed are received prior to the onset of the resizing and repositioning of the dialog box, the resizing and repositioning do not take place.

Further, in connection with the noun verb and verb noun grammar, the application main body 11 supplies the dialog box with the object that the user has selected prior to issuing the command that invoked the dialog box so that the edit control box specifying the selection can be initialized accordingly with the current object.

Other embodiments are within the following claims.

## Claims

1. A method of providing a plurality of controls in a software application comprising the steps of:

dividing said controls into functional hierarchical groups;

assigning labels to each of said controls and each of said groups;

displaying said labels according to a design hierarchy; and

operating on said controls according to said functional hierarchical groups.

2. A method of displaying a plurality of controls in a software application some of which are available comprising the steps of:

determining which of said controls are available at particular time;

generating a glyph for each of said available controls at said time; and

displaying one of said glyphs in proximity to each of said available controls at said time.

3. A method of displaying a plurality of controls in a dialog box some of which are available comprising the steps of:

determining which of said controls are available at a particular time;

generating a glyph for each of said available controls at said time; and

\* \* \*

J.A. 842

EXHIBIT 16

United States Patent

Lyons et al.

Patent Number: 4,989,141

Date of Patent: Jan. 29, 1991

COMPUTER SYSTEM FOR FINANCIAL  
ANALYSES AND REPORTING

Inventors: Richard J. Lyons, West Hempstead;  
Kevin F. Nolan, Middle Village, both of N.Y.;  
Wah C. Chu, Fairfield, Conn.

Assignee: Corporate Class Software, Stamford, Conn.

Appl. No.: 55,823

Filed: Jun. 1, 1987

Int. Cl.<sup>5</sup> ..... G06F 15/30

U.S. Cl. .... 364/408

Field of Search ..... 364/408

References Cited

U.S. PATENT DOCUMENTS

4,321,672 3/1982 Braun ..... 364/408

OTHER PUBLICATIONS

"Using Spreadsheets to Monitor Your Portfolio", Thomas A. Meyers, PC Magazine, Apr. 15, 1986.

Dow Jones Software, product brochure, Spreadsheet Analysis.

Teddi Converse, *Reflex In Business*, pp. 204-217, 1985.

Primary Examiner—Allen MacDonald

Assistant Examiner—Gail Hayes

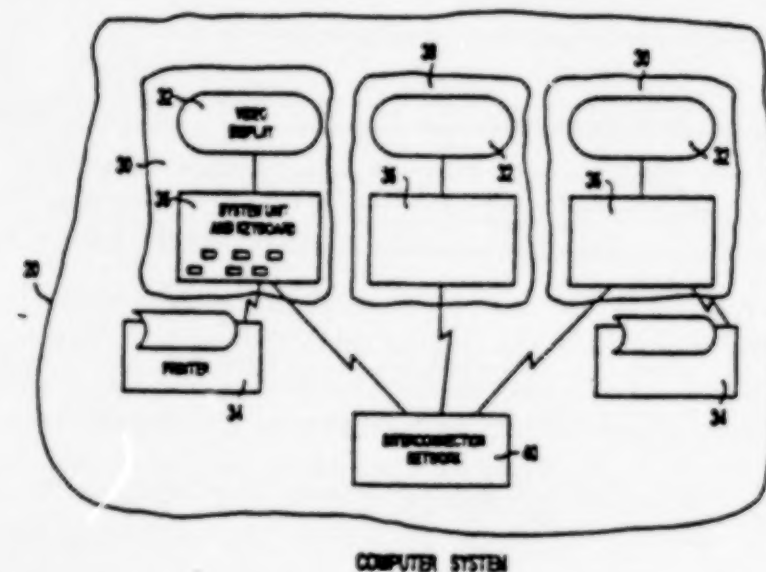
Attorney, Agent, or Firm—Pennie & Edmonds

J.A. 843

ABSTRACT

An advanced financial reporting and analysis software package is described. The package collects, organizes, manages and consolidates financial data and provides user defined capabilities for creating financial and corporate reports. Financial data is organized into four business classifications or dimensions: Schedule, Entity, Period and Type. Data is stored in the system in such a way that all data associated with a particular Schedule, Entity, Period and Type is identified by that particular SEPT value. To accommodate automatic data entry, a mapping means or template is provided that specifies for each different input spreadsheet the location of the first data cell in the spreadsheet and the size of the spreadsheet. Data is read from the data store by various report and spreadsheet generating functions which convert data associated with particular SEPT values to desired output formats.

10 Claims, 29 Drawing Sheets





\* \* \*

TABLE VII

07:06:38 May 19, 1987 QUERY				Pg. 1	
	FY 87	FY 87	FY 87	FY 87	
	ABC	ABC	ASC	ASC	
	ACTUAL	BUDGET	ACTUAL	BUDGET	
	A	B	C	D	
1 Sales	161	170	249	274	
2 Expenses	178	163	163	174	

As will be apparent the report is a two-dimensional array of data. The column headings in this example specify Periods, Entities and Types. Other combinations of up to three of the four SEPT dimensions are possible. These headings are selected by the user by means of the QUERY function and a sub-function named ACROSS. In this example, the row headings are elements of a Schedule; but other headings selected from the SEPT dimensions not used as column headings can be used. The headings are specified by the user by means of QUERY and a sub-function named DOWN.

Table VIII is illustrative of the screen that is displayed when the QUERY function is selected.

TABLE VIII

May 20, 1987 copyright © 1986 Corp. Class Software						READY		
CREATE	INPUT	QUERY	ANALYZE	REPORT	TRANSFER	MAINTAIN	X-RUN	EXIT
<div> <div> <b>DEFINE</b>            RUN            LIST            COPY            ERASE            MODIFY         </div> <div>           ACROSS            DOWN            VALUES            FORMAT            TOTALS            SAVE         </div> </div>								
Database	Drive	Schedule Entry	Period	Type	Memory			
C:TUTOR.DB	C		02 86	ACTUAL	146636			
Define the parameters for a query or a model.								

The DEFINE function allows the user to define a query. For example, the user will set up column and row headings for the report, set up selection criteria, set up format and specify output mode. Column and row headings will be selected from available values of the four SEPT categories.

The RUN function generates a report or a worksheet in response to a query defined by the DEFINE function.

The LIST function lists the available queries that have been established by the DEFINE function. This will allow the user to review his selection criteria, report format and output modes.

The COPY function allows the user to copy an existing query to a new query.

The ERASE function deletes an existing query.

The MODIFY function allows value modifications to an existing query.

By selecting the DEFINE function, the user prompts the system to display a submenu which lists all subfunctions available from the DEFINE function. Table IX is illustrative of the screen displayed to the user once he has chosen the DEFINE function. The user may now go through all of these subfunctions in order to define his query.

TABLE IX

May 20, 1987 copyright © 1986 Corp. Class Software						READY		
CREATE	INPUT	QUERY	ANALYZE	REPORT	TRANSFER	MAINTAIN	X-RUN	EXIT
<div> <div> <b>DEFINE</b>            RUN            LIST            COPY            ERASE            MODIFY         </div> <div>           ACROSS            DOWN            VALUES            FORMAT            TOTALS            SAVE         </div> </div>								
Database	Drive	Schedule Entry	Period	Type	Memory			
C:TUTOR.DB	C		02 86	ACTUAL	146636			
Define the attributes that are going across a query								

The ACROSS subfunction allows the user to select (at most three of the four SEPT variables) (SCHEDULE, ENTITY, PERIOD, TYPE) to be used to define the column headings for a query. The order of selection of the attributes determines their relative levels in the column heading.

The DOWN subfunction allows the user to select the remaining SEPT variables (at most three of the four SEPT variables) to be used to define the row headings for a query. The order of selection of the attributes determines their relative levels in the row headings.

J.A. 846

The VALUES subfunction permits the user to specify available range values for use as row headings.

Once all values are selected, the user may define his report format by choosing the FORMAT subfunction from the Query/Define submenu illustrated in Table IX. This subfunction generates a menu that leads the user through specification of headers (report titles), trailers (footnotes), and data precision (the number of decimal places) and provides the user a choice between sending the report to a printer or an electronic work-

\* \* \*

J.A. 847

EXHIBIT 19

LIBRARY OF CONGRESS  
Washington D.C. 20559

June 15, 1989

Fenwick, Davis & West  
Attn: Stuart P. Meyer, Esq.  
2 Palo Alto Square, Suite 800  
Palo Alto, CA 94306

Re: SPACEMAN II and SPACEMAN III

Dear Mr. Meyer:

Registration was completed for both works and certificates of registration forwarded to you earlier. We apologize for the delay in writing on this material.

During the past year, the Copyright Office reviewed its registration and deposit practices for computer screen displays. As a result of this review the Office announced its decision on June 10, 1988 to allow only a single registration for all copyrightable expression embodied in a computer program, including computer screen displays, and owned by the same claimant. See the enclosed leaflet for additional information.

As the leaflet explains, where the application specifically refers to screens, or where screens are deposited whether mentioned on the application or not, those screens will be examined for copyrightability. Both of these computer programs include a number of screen displays on videotape.

Copyright protects "original works of authorship fixed in any tangible medium of expression." To be regarded as an "original work of authorship," a work must contain at least a minimum amount of original artistic, literary, or musical material. In all cases, only the expression of the author is protected by copyright. The ideas that are embodied in the author's work are not copyrightable.

The Office has a well-established practice of refusing to register claims to copyright in mere format of text or images; this practice is based on the statutory prohibition against copyright in ideas, systems, concepts, or discoveries. 17 U.S.C. 102(b). Similarly, copyright cannot be secured for names, titles, and phrases such as column headings, simple checklists, and the like, nor can it be secured for the format, arrangement, or typography of a blank form or similar work. Thus, in general, menu screens and similar functional interfaces consisting of words or brief phrases in a particular format are not registrable.

Our examination of the videotapes of each work revealed some menu screens which we would not consider registrable. Other screens contained copyrightable material. Registration was completed and, of course, the entire videotape is part of the deposit since it was submitted as a collection. We point out, however, that not all of the individual screens would be registrable if submitted separately.

This letter is for your information only. No reply is necessary.

Sincerely yours,

/s/ PHILL L. GILL  
 Phill L. Gill  
 Head, Literary Section II  
 Examining Division

Enclosures:  
 Screen display leaflet

## EXHIBIT 20

COMPUTER PROGRAMS AND  
RELATED SCREEN DISPLAYS

The Copyright Office has registered claims to copyright in computer programs as literary works since 1964, provided that the work contained at least a minimum amount of original literary authorship. The Office presumed that these registrations extended to all of the copyrightable content in the computer programs. Recently the practice of making separate registrations for computer screen displays raised a number of questions. The courts have affirmed in several videogame cases that pictorial and graphic screen displays may be separately registered. However, courts offered disparate opinions on protection for screen displays other than videogame displays.

To elicit comments on the registration and deposit of screen displays, the Copyright Office held a public hearing in September 1987, and accepted further written comments through October 9, 1987. As a result of that review, in June 1988 the Office announced a decision to require that all copyrightable expression embodied in a computer program owned by the same claimant, including computer screen displays, be registered on a single application form.

This decision also applies to videogame displays; these claims will be treated the same as other claims that include authorship in a computer program and screen displays. A single registration will be made for the computer program and any related audiovisual authorship owned by the same claimant. Separate registrations will not be made.

The Copyright Office has consistently held the view that a single registration is sufficient to protect the copyright in a computer program, including related screen displays, without a separate registration for screen displays or reference to the displays in the "nature of authorship" description on the application. An application may give a general description such as "entire work" or "computer program." This descrip-



tion would cover any copyrightable authorship contained in the computer program and screen displays, regardless of whether identifying material for the screens is deposited.

Applicants who previously made a single registration for a computer program should be assured that the registration covers all of the copyrightable content of the computer program. The Office will not make a new basic registration or a supplementary registration to allow a separate claim in the screen displays. Neither will the Office accept identifying material for the screens contained in any previously registered computer programs.

#### HOW TO REGISTER COMPUTER PROGRAMS/SCREEN DISPLAYS

A single registration will be made in the class in which authorship predominates. Because the computer program is a literary work, literary authorship will predominate in most works, including many in which there are screen graphics, and registration will generally be appropriate on Form TX. If pictorial or graphic authorship predominates, registration may be made on Form PA as an audiovisual work or on Form VA.

The registration will extend to any related copyrightable screens, regardless of whether identifying material for the screens is deposited. **Where identifying material is deposited, it will be examined for copyrightability.**

Where the applicant refers to screen displays on the application, identifying material for the screens *must* be deposited.

To make registration for a computer program and its related screen displays:

- \* Select application form according to which kind of authorship predominates.
- \* Follow the chart on the next page to complete space 2 of the application and to determine whether to file identifying material *for the screen displays*.

\* Fill out and submit the application along with:

- \* The appropriate deposit for the *computer program* (preferably the first and last 25 pages of the program in source code);
- \* A non-refundable filing fee of \$10;
- \* Optional identifying material for the screen displays.

#### HOW TO COMPLETE THE APPLICATION

##### Space 2

- Opt. 1 "Entire work"  
or  
"Entire computer program"
- Opt. 2 "Entire work"  
or  
"Entire computer program"
- Opt. 3 "Entire computer program including text of screen displays"  
or  
"Entire computer program including audiovisual material"  
or  
"Entire computer program including artwork on screen displays"

Note: The description of authorship on the application should NOT refer to elements such as "menu screens," "structure, sequence and organization," "layout," "format" or the like.

#### WHAT TO DEPOSIT

##### ID Material for Screens

You may choose NOT to deposit ID material

You may choose to deposit ID material

You **MUST** deposit ID material

Note: Identifying material for screen displays should consist of printouts, photographs, or drawings clearly revealing the screens. For works that are predominately audiovisual, such as video-

J.A. 852

games, 1/2 inch VHS video-  
tape is acceptable. ALL  
screen identifying material  
will be examined for copy-  
rightability.

J.A. 853

EXHIBIT 21

UNITED STATES COURT OF APPEALS  
FOR THE NINTH CIRCUIT

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No. 89-15683

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ASHTON-TATE CORPORATION, a Delaware corporation,  
Appellee/Plaintiff,

vs.

RICHARD ROSS; BRAVO TECHNOLOGIES, INC.,  
a California corporation,  
Appellants/Defendants.

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RICHARD A. ROSS and BRAVO TECHNOLOGIES, INC.  
Counterclaimants-Appellant,

vs.

ASHTON-TATE CORPORATION,  
and DOES ONE through FIVE,  
Counterdefendants-Appellees.

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On Appeal from the Order of the United States  
District Court for the Northern District of California  
No. C-88-2844 DLJ

Honorable D. Lowell Jensen, District Judge

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## APPELLANTS' OPENING BRIEF

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 BRAVO TECHNOLOGIES, INC.

---

[25] *authorship* that went beyond the *ideas* expressed in the status screen. According to the Northern District of Georgia:

In the instant case, however, the arrangement of the status screen involves considerable stylistic creativity and authorship above and beyond the ideas embodied in the status screen. It cannot be said that the idea of the status screen . . . could not have been expressed in a large variety of ways. The defendants have never contended that they could not have arranged the parameters/commands in a wide variety of patterns without hampering the operation of their program. The parameters/commands could have been arranged and delineated in an almost infinite number of horizontal and vertical patterns and groupings that would be substantially dissimilar to the arrangement and groupings utilized by the plaintiff. Likewise, the defendants could have used a wide variety of techniques to indicate which symbols the user should type to effectuate a command. . . . The modes of expression chosen by the plaintiff for its status screen are clearly not necessary to the idea of the status screen. Therefore, the plaintiff's mode of expression of the sta-

tus screen does not merge with the idea of the status screen.

*Softklone*, 659 F.Supp. at 460. Exhibits 8 and 9 display numerous decisions by the authors about the ordering of the commands and their arrangement in the user interface. The fact that the authors of these design documents chose the order and groupings displayed, out of a nearly infinite number of possibilities, constitutes creative authorship according to the *Softklone* court.

The District Court in the present case erroneously found that Exhibit 8 was not copyrightable because it did not contain source code. (Excerpts, Tab 103, p. 10). In *Softklone*, the Northern District of Georgia stated that a status screen constitutes a "literary work," within the meaning of 17 U.S.C. § 101, when written on a piece of paper, such as in Exhibits 8

\* \* \*



## EXHIBIT 23

## United States Patent

Crehan et al.

Patent Number: 4,611,306

Dated of Patent: Sep. 9, 1986

## DISPLAY MENU/CHART KEY

Inventors: Donald T. Crehan, Gaithersburg, Md.;  
Charles J. Lovell, Austin, Tex.Assignee: International Business Machines Corp.,  
Armonk, N.Y.

Appl. No.: 493,572

Filed: May 11, 1983

Int. Cl.<sup>4</sup> ..... G06F 15/62; G06F 3/037;  
GO6F 15/626; GO9G 3/02U.S. Cl. .... 364/900; 364/521;  
340/712; 340/747Field of Search ..... 364/200 MS File, 900 MS File,  
364/521, 522; 340/712, 721, 747

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Primary Examiner—James D. Thomas

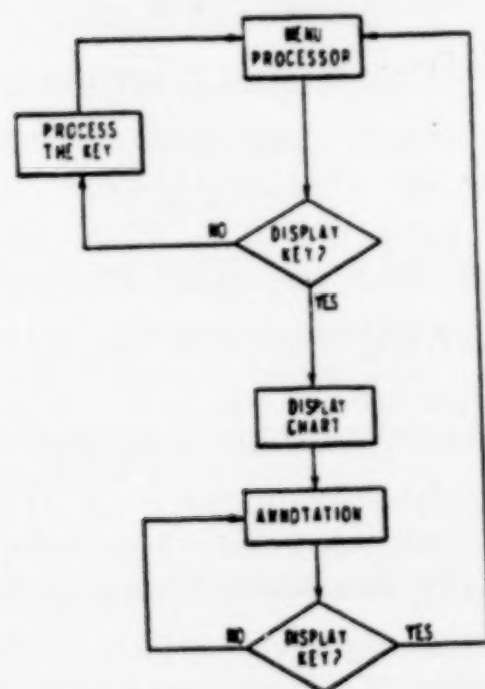
Assistant Examiner—Thomas Lee

Attorney, Agent, or Firm—C. Lamont Whitham

## ABSTRACT

A display menu/chart key is provided in a word processing system to allow a system operator to toggle back and forth between the display of a menu used to define a graphics image and the graphics image to the extent that the graphics image has been defined by the menu. This provides an easy interface that allows the operator to visually check and revise the definition of a graphics image such as a bar, line or pie chart. By using this key, the operator can quickly see how changing a menu item will cause the chart to be changed and the particular portion of the chart that will change. When the key is pressed while a chart is being displayed, the last menu being processed will again be displayed.

## 3 Claims, 3 Drawing Figures



\* \* \*

Suppose that a bar chart is not selected but instead a line chart is selected. In this case, the following menu is displayed:

LINE CHART DESCRIPTION			
<i>Id.</i>	<i>Item</i>	<i>Your choice</i>	<i>Possible choices</i>
a	Display Example Screen		
b	Number of Lines Vertical Axis	1	(1-4)
c	Total Number of Labels	5	(2-15)
d	Top Label Value	100	
e	Bottom Label Value Horizontal Axis	0	
f	Total Number of Labels	3	(1-24)

When finished with this menu, press ENTER  
Type ID number to choose ITEM, press ENTER:

Once the line chart had been defined using this menu, the "Data Entry" menu for the line chart would be displayed. This menu is quite similar to that shown above for the vertical bar chart except that the word "line" is substituted for the word "bar" at the heading of each of the four data entry columns.

Finally, suppose that a pie chart had been selected instead of the bar chart as illustrated in the "Create or Revise Chart" menu shown above. In this case, a simple two column "Data Entry" menu for the pie chart is displayed. The first column has the heading "Section Labels" and the second column has the heading "Values". FIG. 2 does show yet another possibility, that of a free-form chart, but that does not involve data entry. FIG. 2 is itself a good example of a free-form chart.

In the creation or revision of a chart as described above, it will be recalled that as each menu in succession is finished, the "Enter" key is pressed. Thus, by pressing the "Enter" key, the operator can page from the "root" to the "leaves" in the tree structure shown in FIG. 2. It is also possible to page backward from the "leaves" to the "root" by pressing another key provided specifically for that purpose. The problem solved by this invention is to provide an easy to use interface to the operator that gives the operator the capability to check the progress of the chart definition and to return to the current place in the chart definition with a minimum of keystrokes. Requiring a single keystroke was chosen as the optimum. Allowing no keystrokes suggests a timed image display, and this could be an undesirable interface in that multiple keystrokes would be required to display the chart image for long periods of time. Allowing, or, worse yet, requiring the operator to set or define the time intervals would make the interface more cumbersome. Further, more than a single keystroke would not satisfy the "minimum" requirement implicit in the easy to use interface.

The solution according to the invention is to provide a single key on the keyboard that causes the chart to be displayed



and also causes a return from displaying the chart to the menu in the chart definition process that was last active before the key was pressed to display the chart. For example, suppose the operator has elected to display a vertical bar chart but has not yet defined the axis parameters or entered any numerical data. By pressing the display menu/chart key, the operator can have the chart displayed which at this point would consist of horizontal and vertical axes. By again pressing the display menu/chart key, the last active menu would be displayed which in this case would be the "Axis Definition" menu. When the operator is finished with this menu the "Data Entry" menu will be displayed, but before entering data, the operator can again press the display menu/chart key to observe the axes of the chart as it has been defined. Pressing the display menu/chart key again will cause the "Data Entry" menu to be displayed again. At any time while the operator is entering data into this menu, the display menu/chart key can be pressed to see how the chart is developing. In this way, the operator has a simple way to check the progress of defining the chart by viewing it as it is currently defined, as well as having a simple way to continue defining the chart, or to modify some definition that had been previously entered, without having to page back and forth through several menus, or worse, having to start at the beginning of the process.

FIG. 3 shows a flow diagram illustrating the operation using the display menu/chart key according to the invention. The operator begins by defining the chart using the various menus that define the chart type, scaling, orientation, data to be plotted and so forth. During this time, the keyboard is monitored to determine if the display menu/chart key has been pressed. If it has not been pressed, the key that has been pressed is processed in the usual way. At some point during the definition, the operator may decide to see what the chart looks like at the current stage of the definition and so presses the display menu/chart key. This is detected by the menu processing software which then calls the display chart processing software. In response to this call, the chart is built and displayed to the extent possible with the current chart defi-

nition. At this point, the operator would be allowed to "annotate" the chart as may be desired. Application Ser. No. 493,581 entitled "Independent Image and Annotation Overlay with Highlighting of Overlay Conflicts" describes this process. After making an annotation or not, the operator might then decide to continue defining the chart, or to redefine some part or all of the chart. To do this, the operator again presses the display menu/chart key, and the display chart processing software recognizes this as the signal to return to the menu processing software. Those skilled in the art will understand that the nature of the "call" and "return" functions in software is that the point of operation will continue after a "return" at the point immediately after the "call". The procedure is well known and will not be described in any further detail. The important thing to understand is how the procedure is used in the operation of the invention. Thus, when the menu is displayed again, the operator can continue with the chart definition until completed or until s/he wants to view the chart again at the new level of completion.

The display menu/chart key according to the invention need not be an added key to the word processing system keyboard. In the preferred embodiment, the display menu/chart key is a software defined key that is recognized by both the menu processing software and the display chart processing software. In this way, the key may be used to toggle back and forth between the display of the current menu and the chart.

We claim:

1. A process for interactively constructing a graphic image on a video display terminal provided with a display menu/chart key for toggling between the display of a menu and the display of a chart comprising the steps of:

- displaying to an operator a construction menu listing a plurality of selectable construction parameters which define the graphic image to be constructed;

- displaying a data entry menu to said operator after the construction parameters have been selected in said construction menu and allowing the operator to enter data



or change data already entered in said data entry menu at any time during said process for interactively constructing a graphic image when said data entry menu is displayed;

upon detecting the actuation of said display menu/chart key while displaying said data entry menu, displaying to the operator a graphic image on said video display terminal as defined by entered and changed data at the time said display menu/chart key is activated; and

upon detecting the actuation of said display menu/chart key while displaying said graphic image, redisplaying said data entry menu so that the operator can view the progress of constructing the graphic image on said video display terminal as data is entered or changed in said data entry menu at any time during said process of interactively constructing a graphic image by toggling between the display of said data entry menu and the chart

2. The process for interactively constructing a graphic image on a video display terminal as recited in claim 1 wherein the operator is allowed to select construction parameters of change construction parameters already selected in said construction menu at any time during said process for interactively constructing a graphic image when said construction menu is displayed further comprising the steps of:

upon detecting the activation of said display menu/chart key while displaying said construction menu, displaying to the operator a graphic image on said video display terminal as defined by the construction parameters selected or changed when said display menu/chart key was activated; and

upon detecting the actuation of said display menu/chart key while displaying said graphic image, redisplaying said construction menu so that the operator can view the chart as defined by construction parameters which have been selected and changed in said construction menu at

any time during the process of defining the graphic image to be constructed.

3. A process for interactively constructing a business chart on a video display terminal provided with a display menu/chart key for toggling between the display of a menu and the display of a business chart, the type of business chart being a bar chart, a pie chart or a line graph, said process comprising the steps of:

displaying to an operator a construction menu listing a plurality of selectable construction parameters which define the business chart, said construction parameters including the type of business chart and its scale, and allowing the operator to select construction parameters or change construction parameters already selected in said construction menu at any time during said process for interactively constructing a graphic image when said construction menu is displayed;

upon detecting the activation of said display menu/chart key while displaying said construction menu, displaying to the operator a graphic image on said video display terminal as defined by the construction parameters selected when said display menu/chart key was activated provided the type of business chart has been selected; and

upon detecting the activation of said display menu/chart key while displaying said graphic image, redisplaying said construction menu so that the operator can view the chart as defined by construction parameters which have been selected and changed in said construction menu at any time during the process of defining the graphic image to be constructed.

\* \* \*

## EXHIBIT 27

## QUATTRO PRO DISPLACEMENT STUDY

December 17, 1990

MRD # 341

Prepared by: Gasteiger & Associates  
in collaboration with Nancy Merz

\* \* \*

## [3] Methodology

Thirty-two in-depth telephone interviews with Quattro Pro purchasers were contacted by experienced, executive interviewers. The interviews were approximately 15 to 30 minutes in length.

An incentive of \$50 was be offered to respondents to increase the cooperation rate (sample names are limited). Lotus was not identified as the sponsor of the study. Sample (a total of 90 sample pieces) for the study was obtained from the 1-2-3 Upgrade Penetration Survey and the Magellan Early Adopter Study where Quattro users have already been identified. Of the completed interviews, 14 users came from the Magellan Early Adopter list and 18 came from the 1-2-3 Upgrade list.

Because of the short turn-around time required for the survey, two suppliers were used: Gasteiger and Associates of Brighton and Keady and Associates of Boston.

## Summary of Results

*Best Spreadsheet*

Out of the 30 users interviewed, 20 rated Quattro or Quattro Pro as the best spreadsheet on the market. Two respondents rated it tied as the best, one with 1-2-3 and one with Excel. Only 10 rated 1-2-3 the best. And, one felt SuperCalc was the best spreadsheet.

Not surprisingly, the ratings were quite different depending whether the respondent came from the 1-2-3 upgrade list or the Magellan list. Only one user of the 14 from the Magellan list rated 1-2-3 the best, whereas nine of the 18 from the 1-2-3 Upgrade list liked 1-2-3 the best.

Users had a wide variety of reasons for saying Quattro Pro the best spreadsheet:

"It has a good preview of printing features, and I like the mouse support efficiency."

". . . because of the ability to tie-in Quattro Pro with the Paradox."

". . . with Quattro Pro, you can view more styles of graphs, more different types than you can through Lotus. And it has better color."

"With Quattro it's so much easier to do graphics and report types."

"It's friendlier than Lotus."

"It's easy to use. The hardware requirements are not as massive as Lotus 3.1. . . . The graphics. It seems like a more user-friendly program. It's not as expensive."

[4] Flexibility. Power. Compatibility. Presentation. Utilities."

Those who preferred 1-2-3 seemed to like it better because they were accustomed to it:

"I've been using it for years."

"Because I am the most familiar with it."

"It's the one I use most often."

". . . the one that has fulfilled my needs the best, has worked the best for me."

"There's always been a 1-2-3 out there, so everyone know how it works and why it works."



Only a few users had specifics to explain why 1-2-3 was the best spreadsheet. In those cases, the users had just upgraded to Version 3.1.

"Well, the new Lotus 3.1, we're pretty happy with, the one that packages Impress and everything and basically goes with a what-you-see, what-you-get type of technology and seems to have good print drivers."

### *Spreadsheets Being Used*

Of the 32 Quattro users, 20 were still using 1-2-3 in some form or another. This again varied depending on which list they came from. Sixteen of the 18 users from the 1-2-3 Upgrade list were still using 1-2-3 versus four from the 14 users from the Magellan list.

Other spreadsheets used include: SuperCalc, ProCube, VP Planner, and Excel.

Of those who used both 1-2-3 and Quattro, the amount they used one versus the other varied widely. The numbers were split pretty evenly between those who use Quattro more, those who use 1-2-3 more, and those who use them the same amount.

When asked about the type of work they used Quattro for versus 1-2-3, the answers varied widely. The most common division of the two was using 1-2-3 for number-crunching and Quattro for the printing. However, there was one person who does exactly the opposite.

"I use Quattro about 40% of the time and 1-2-3 60% of the time. I use 1-2-3 for day-to-day number crunching. I use Quattro for anything that needs to look nice and dressy."

"I split things probably 50/50. I like 1-2-3 when I'm doing something very, very high grade, and I want to have desktop publishing. . . . I use Quattro for regular number crunching." (*Uses 1-2-3 3. 1*)

\* \* \*

[6] In addition, many people did receive the mailing offering an upgrade from 1-2-3 to Quattro for \$99. Most of them were unsure exactly how Borland got their names for the mailing; they weren't sure if Borland got it off a subscription list or really knew they used 1-2-3. It was a very compelling offer for everyone who did get it. The few who didn't act on it were those who already had Quattro.

### *Price*

Price, particularly the \$99 offer, was extremely compelling to most of the Quattro users. Sixteen of the respondents got Quattro for \$99 and seven said they got it for less than \$99. Of 31 respondents, only three paid more than \$100 - \$150, \$319, \$425.

When asked whether price influenced their decision to buy Quattro, 21 of the respondents said, "Yes." That was the most common reason, but not the only reason, for buying the product.

"That offer totally influenced my decision to buy it. I probably wouldn't have bought Quattro otherwise."

"It was the decisive factor in buying the Quattro, because it was worth the risk, and I know I wouldn't have bought it at full price since I already had and was using 1-2-3."

"They would give you everything Lotus 2.2 can do—and more—for \$99. I may be dumb, but I'm not that dumb."

"There was no big incentive to switch—until they enticed me."

### *Hardware*

Hardware requirements were a crucial decision point for a few of the users. This was less of an issue with respondents from the Upgrade list. Overall, eight mentioned Quattro's lower RAM requirements and five mentioned not having to upgrade their hardware.



Most of these users clearly could not use 1-2-3 3.0 or 3.1 on their machines. They focused on the requirements for Version 3, not Version 2.2 when comparing Quattro's hardware requirements to 1-2-3's.

#### *Other Influencing Factors*

Almost every respondent had read one or more reviews raving about Quattro Pro. Several mentioned a review in *PC Magazine* that rated it the number one spreadsheet. Several others mentioned articles in *InfoWorld*. For the most part, they did not know exactly where they had read the information, but they did know they had read good things about it.

On the other hand, very few had spoken to colleagues about the product. Most said they didn't know anyone who used the product before they had bought it. This was particularly true of those users who bought Quattro when it first came out.

The most commonly mentioned influencing reasons for buying Quattro that haven't already been mentioned were:

Graphics/graphs	9 respondents
Presentation quality	8
Compatibility with 1-2-3	6
Better interface/menus	4

Other reasons included: ease of use, on-screen help, mouse support, flexibility, colors, power.

#### *Where Bought*

Twenty-four respondents knew where they bought Quattro. The majority, 14, bought directly from Quattro. In virtually all these cases, they were taking advantage of some \$99 offer for the product. Six respondents bought from a retail store, and several of them got the \$99 offer there as well. It seems Egghead was also selling Quattro for \$99 for a time.

#### *Previous Spreadsheet Use*

No one was using Quattro as their first-time spreadsheet. The vast majority, 24, had either used 1-2-3 before or were

still using it. Considering that half of those interviewed came from a 1-2-3 upgrade list, this was not surprising. The other previously or currently used spreadsheets were:

SuperCalc	3 respondents
VP Planner	2
ProCube	2
Excel	2
Condor 3, DB Excel, Shareware, Symphony and Visicalc—	1 each

#### *Overall Satisfaction with Quattro and 1-2-3*

It is important to keep in mind that the satisfaction ratings refer to a wide variety of versions. The Quattro users were rating anything from the original Quattro to Quattro Pro 2.0. The 1-2-3 users were referring to any version from 2.01 to 3.1.

Half rated themselves "Completely satisfied" with Quattro and half rated themselves "Somewhat satisfied." Only one user rated herself "Somewhat dissatisfied." Those who rated themselves "Somewhat satisfied" either had a specific glitch or glitches they wanted fixed, or they felt nothing is perfect, so no product could make them "Completely satisfied."

Twenty-three current or former 1-2-3 users also rated their satisfaction with 1-2-3. Six were "Completely satisfied", 15 were "Somewhat satisfied", and three were "Neither satisfied nor dissatisfied." Most of those who were less satisfied were referring to version 2.01 that they used before changing to Quattro.

\* \* \*

[11] Good reviews in magazines reinforced the respondents' desire to give Quattro a try. Most of these users were intermediate or advanced users who pay attention to what is going on in the personal computer industry. They were curious what all the fuss was about. Since such a small percentage of spreadsheet users are Quattro users, they depended on the expert opinions of the magazines instead of friends' opinions.

*Once they use it, most people are very happy with Quattro.*

Quattro is a good spreadsheet, and users see this. For most of them, it will do everything they need to do, in a way they want to do it. The graphics capability has a lot of appeal to many of the users. In addition, many are simply attracted to the colors and the appearance of the screen. They feel it adds a little pizzazz to the otherwise dull job of using a spreadsheet.

*Hardware limitations make Quattro a necessity for some.*

A small portion of the Quattro users are limited by the hardware they or their company uses. In most cases, it is an issue of RAM. All of them complain that 1-2-3 takes a tremendous amount of memory and simply can not run on their machines.

This reason may be considerably more important than this small survey showed. Since over half of those surveyed were 1-2-3 upgraders, it was likely they had enough hardware.

*Users see Quattro as a 1-2-3 equivalent product for less money.*

From reviews, and then later from their use, users feel that Quattro can do everything 1-2-3 can do. The most objective of them realize that Quattro can do some things better, and 1-2-3 can do other things better. However, the big difference is price. Because virtually all of those interviewed got their Quattro for less than \$100, they see Quattro delivering a tremendous amount of power for a low price. While they may have seen 1-2-3's price as reasonable before, they now see an equivalent product for less money. Rationally, they feel it makes sense to go with the less expensive option.

"With the latest version (of 1-2-3), I have the impression it's a very expensive spreadsheet for very expensive hardware."

*Quattro's compatibility with 1-2-3 is crucial in this 1-2-3 world.*

Although many of the users have convened entirely to Quattro, its compatibility with 1-2-3 is still crucial to them. It seems very few of the users would have bought Quattro if they hadn't been able to convert their 1-2-3 files into Quattro files very easily. It continues to be important, because the users frequently exchange files with 1-2-3 users.

[12] Being able to change the menu structure to replicate the 1-2-3 menu structure is also very appealing to many users just converting from 1-2-3. Most of the Quattro users interviewed do use the menus as Quattro has set them up, but they appreciate the ability to use Quattro as 1-2-3 when they need to. One man went as far as saying that he recommends Quattro to other users, because it means they can get both Quattro and 1-2-3 in the same package.

*There is still an entrenched 1-2-3 user base out there.*

Several of the respondents barely used Quattro. They had bought it as a test and had decided not to switch. Most of them said they felt too familiar with 1-2-3 to try to change to something else. A few of the Quattro users had been trying actively to convert 1-2-3 users in their office to Quattro but were having no success. They said the other users were unwilling to switch. Unfortunately, it appeared that most of the 1-2-3 users did not necessarily think 1-2-3 was better, they just thought it was the product they were used to.

#### Recommendations

*Pour all available resources into marketing Version 2.2 and the upcoming 2.3, particularly making a clear distinction between them and Version 3.1.*

The product to beat Quattro Pro with is 2.3, not 3.1. Although most of the Quattro respondents were fairly advanced PC users, they were either light spreadsheet users or doing basic number crunching. Because of Lotus' focus on 3.0, and now 3.1, as the flagship product, everyone seems to



picture those products when they describe 1-2-3. In particular, these Quattro users focused on the memory and processor requirements for 1-2-3 3.0. This is *not* an issue for 2.2, but no one seems to be considering 2.2. Those with lower-end machines should feel that 1-2-3 2.2/2.3 is *the* product for their machines, not a lesser version of 3.0.

*Play-up the graphics, colors, and presentation capabilities in 1-2-3 2.3.*

Even if they don't use them very much, users were impressed by the "pretty" aspects of Quattro. They like the colors and the nice screens. They like being able to make impressive graphs easily. Many of them do not do intensive spreadsheets, number-crunching work, so the aspects of a spreadsheet that impress them are the easy "ooh and aah" factors. Having spreadsheet publishing capabilities in 2.3 will probably go a long way in handling the inequities.

*Consider some special discounting of 2 3.*

Don't give the software away for free. Offering it for free makes people suspicious that something is wrong. 1-2-3 is still seen as the de facto leader in the spreadsheet market, so Lotus shouldn't look desperate.

## EXHIBIT 36

Jim Manzi

Staff Meeting

Royal Sonesta

November 16, 1990

You probably noticed that this meeting was postponed a few times. Since the last time we met was after we announced the Novell merger, we wanted to do something different this time. As you all know, this morning we announced we are acquiring Samna, the developers and marketers of the best word processing package for Windows. This is a little different from Novell.

It's smaller.

It's in the same time zone.

And most importantly this is further along. We have a final agreement rather than an intent to merge. There's more work to finalize it but we are way down the path.

We also have had our blood tests. They tested OK. And so did we.

We got our marriage license.

And we even like each others' relatives.

I'll come back to Samna in a few minutes because it's part of a large story and larger discussion.

Agenda:

1. Status of our business.
2. Challenges we face in the immediate future
3. Review our primary objectives and priorities.

I'll be followed by Frank King, Frank Moss, and Bob Schechter and then come back for questions at the end.

Current Status:

I have a few tough messages to deliver today because I think we are heading for tough economic times as you know.



There are probably 100 meetings at major companies right now holding a meeting like this one.

This meeting is going to be a lot easier than those being held by real estate developers, or mini-computer makers or major banks.

Before I continue any further, let me say right now we are not here to talk about layoffs or downsizing. We have no plans and no intentions of doing that. We are here to have a straight talk about the state of our business, our market, our competition.

And above all, we are here to talk about being smart and being prudent in this new type of environment.

Let me begin with the current situation.

1. Like never before we are under attack in our core business.

- position still strong but we have strong competitors

2. We have a big competitive exposure until next year

- Windows vs. OS/2
- top priority development of Windows products
- great uncertainty around the size of this exposure

3. When there's more competition, the cost of doing business goes up

- increased marketing and selling costs
- increased development costs when reacting as opposed to leading

We have shipped Release 3.1 last month. What we know now:

- sell thru data at near record levels
- customer support volume—a good sign of early usage—already passed.

2.2 and 3.0

- marketing activities appear to be on track
- live in-store upgrades
- new advertising
- major direct mail effort

But, the competition is stronger and smarter.

Great need to overcome our competitive challenges as quickly as possible.

First from Excel:

- While 3.1 runs under Windows, we need our full Windows product ASAP because the lack of it is costing us some business.

- size of this exposure unknown

- Windows is going to be extremely important: will have several windows apps next year; in fact, we will have an extremely competitive line up of apps for Windows next year.

We have a very strong competitor, as you know, in Microsoft. Let me show you how strong (SLIDE).

But this is the result of silicon steroids. Over time, I think steroids will be hazardous to your health.

Competition from Borland:

- didn't take them seriously enough
- targeting our upgrade business; our existing users
- more aggressive than we were in marketing efforts

They have taken some market share points. 1 point equals \$5 mm to \$7 mm

Borland, or Mr. Kahn, is like the man who came to dinner. Phillipe has stayed around too long eating from our menu. (Here is a pictorial representation of what I mean). (SLIDE)

His eating shows in his waistline and his marketshare.

In Phillipe's case he does look imposing but this is a function of not too many steroids but too many donuts. And we all know that donuts are hazardous to your health long term as well.

It is time for Phillipe to leave the table.

To be a bit more serious:

Need to do whatever it takes to drive them out of our business.

This is not business as usual. These are not two ho-hum competitors. These are two very savvy companies who are trying real hard to damage us competitively and we will stop at nothing to defend and extend our spreadsheet franchise. Just as they will stop at nothing to get some of our business.

## EXHIBIT 38

## Houdini Analysis of Competitive Products

## Automation

**Definition:** Most casual users see the primary benefit of a command language to be its ability to automate otherwise manual keystrokes or mouseclicks. Users who create automated macros tend to be more product-wise than technical. Macros are typically written as isolated snippets designed to speed up a tedious spreadsheet task.

**Examples:** Macros written at this level are often used to print ranges within a worksheet, save files, or change the style or font of a cell in a GUI spreadsheet without selecting a dialog box or menu. One of the most popular 1-2-3 macros provided an automatic switch between the numlock and enter keys as a workaround for number entry on the IBM numeric keyboard.

		Excel			
LEAF		HTalk	FImpact	Wingz	R3
1	Developer				Casual 10

## Automation

**Languages Compared:** Early releases of 1-2-3 were successful in encouraging casual users to automate spreadsheet routines through the straight forward mimic of first letter menu commands. 1-2-3 Release 3 offers a Learn mode that records up to 256 keystrokes and collects them into a spreadsheet cell for inclusion in a macro. The user is required to name and invoke the macro. Both *Excel*, *Full Impact*, and *Wingz* provide macro recorders that mimic both keystrokes and mouseclicks. They both offer automatic naming and immediate playback. *LEAF* does not offer a recorder, but it is not directed at the casual user.

*HyperTalk* uses different methods to provide for the non-technical, casual user. Many useful *HyperTalk* examples are shipped with HyperCard. Users can look behind any button or card in HyperCard to review its underlying script. The plain English syntax is clear and approachable. An excellent context-sensitive help system is available. Users are encouraged to give scripting a try. Wingz also uses plain English syntax in its HyperScript language, and a similar method for viewing underlying scripts.

## EXHIBIT 39

To: Lotus Federal Marketing

From: Larry Roshfeld, Systems Engineer

Re: Review of Excel

Date: December 14, 1987

After recently spending some time working with Microsoft PC Excel, I thought I'd share with you my impressions of the product, based on my background as an advanced 1-2-3 user. Keep in mind that the following comments are biased, not because I work for Lotus, but rather because of how comfortable I am with 1-2-3. I will, when appropriate, attempt to point out areas of functionality in Excel that would be perceived differently by an experienced 1-2-3 user versus a novice spreadsheet user. This document is not intended as an exhaustive look at PC Excel, but rather as a way to quickly introduce you to the relative advantages and disadvantages of PC Excel compared to 1-2-3 Release 2.01. I would prefer that you not quote from this document to your customers, since the opinions expressed below are my own, and *NOT* Lotus Corporate Policy.

For those of you who would like a simple overview:

#### *Executive Summary*

PC Excel has vastly greater functionality than the current version of 1-2-3, for roughly the same price. Release 3 of 1-2-3 will add some of the features to 1-2-3 that are now currently found only in Excel, but there are some features in Excel that will not be included in 1-2-3 Release 3, and which may or may not be present in 1-2-3/G.

PC Excel requires a relatively sophisticated and expensive hardware platform. Yet even with this hardware, it "feels" slow, due to the fact that it is running under Windows 2. Paradoxically, the sophisticated 1-2-3 user who would most ben-



efit from the enhanced features in PC Excel, and who is most likely to already have the hardware required to run the product, is also the person who will have the greatest difficulty learning the product. PC Excel will be a difficult product for an experienced 1-2-3 user to learn, since its basic structure and functionality is very different from 1-2-3. It will be less difficult for a novice spreadsheet and/or PC user to learn, since they will have little to "unlearn." Existing 1-2-3 worksheet files can be brought into PC Excel, with little or no loss of formatting or functionality. PC Excel can also save files in a 1-2-3 file format.

\* \* \*

experience, most PC users are not comfortable with a mouse. This will greatly hurt the chances of acceptance of a product, like Excel, that is very mouse dependent.

Historically, there have been a number of spreadsheet products on the market that have had greater functionality than 1-2-3. They have not made a significant dent in our market share due to a number of reasons, including the entrenchment of 1-2-3, the investment by customer organizations in training and application development, and the availability of third party templates and add-ins. While PC Excel will be able to compensate for some of the above, it probably can't overcome them. We will lose some users, and even user departments, to PC Excel, but if we do our job correctly, we should not lose any accounts.

I personally am more concerned about competition from Quattro, the new spreadsheet from Borland. It is priced at \$195 retail, and offers the user a more powerful and flexible spreadsheet than 1-2-3, with the option of a "1-2-3 like" interface. I will be taking a look at Quattro in the next month, and will at that time provide you with my review of the product.

## EXHIBIT 40

Memo to: Distribution List

From: Stacy Gasteiger

RE: 1-2-3 3.0 POSITIONING STUDY

The attached study summarizes the results of six focus groups we held in January to help position Release 3.0. The groups were very consistent and gave us a lot of helpful information about the upcoming product release.

There should be a half-hour edited version of the focus groups available for viewing in early March. I will let you know when you can take a look at it.

## DISTRIBUTION LIST:

Liz Suneby	John Lloyd—LMS (2)
Bill Huff	Rob Perry
Laurie Phelan	Dave Barrett
Irfan Salim	Paul Pagett
Chuck Digate	Isabel Oswell—Windsor (4)
Frank Ingari	Greg Jarboe
Peter Simon	Betsey Kosheff
Scott Tucker	Tom Hughes
Linda Volpert	Carol Simpson
Jim Richard	Eileen Rudden
Kelsey Selander	Dave Pritchard
Frank Ingari	Lotus Japan

(ii) 1-2-3 RELEASE 3.0 QUALITATIVE  
RESEARCH STUDY

## EXECUTIVE SUMMARY

## BACKGROUND

Lotus is currently scheduled to ship 1-2-3 Release 3.0 in mid-July, 1988, which means that all the marketing communications activities, including advertising, will begin the same

month. The initial campaign will be targeted at current 1-2-3 users, management, and DP/MIS people in Fortune 500 companies.

When 1-2-3 3.0 ships, Excel for the PC will have been on the market for nine months. Excel has been positioned as the spreadsheet for the newest technology, the 386 machine. In addition to targeting new users, it is targeting 1-2-3 users who want more power. Quattro will have been on the market for nearly a year. Borland is positioning Quattro as a full-powered spreadsheet for a significantly lower price.

Given how critical 1-2-3 is to Lotus, the product marketing group and advertising group wanted to do research to confirm or dispute their best assumptions about optimal 1-2-3 3.0 positioning in Lotus's communications, including advertising, PR, collateral, packaging, etc. Additionally, this research would give us some clues on Excel's long-term product potential.

#### DECISIONS TO BE MADE

To determine which of the attached positioning statements Lotus should focus on.

To determine what points about Release 3.0 best support the positioning platform.

To determine whether different positionings are required for end-users, departmental managers, or MIS/InfoCenter managers.

#### OBJECTIVES

To test positioning statements and support points. To determine how the positionings are rated on:

Importance  
Uniqueness  
Understanding  
Likelihood to purchase  
Overall

\* \* \*

#### [iv] SUMMARY OF FINDINGS

##### *1-2-3 Usage and Satisfaction*

People appear to be generally satisfied with 1-2-3. However, with the arrival of competitive spreadsheet products, Lotus seems to be caught in a spiral of rising expectations as customers now demand more advanced capabilities.

MIS and Department managers are keenly aware of competing products and their perceived advantages, including price. What restrains those who might consider switching over is their investment in Lotus and the costs of retraining end-users.

Participants' chief perception of Excel centers around its graphic interface and design. Quattro seems to be well known primarily for its price.

On an abstract level, many people are intrigued by the new advanced features of the OS/2 and Presentation Manager technologies. However, on a more practical level, MIS and department managers are taking a cautious, wait-and-see attitude.

There is a general feeling that 3.0 represents a technological "catch up" for Lotus. At the same time, people feel that most end-users will not take advantage of the new features.

##### *1-2-3 Upgrade History and Plans*

The administrative "nightmare" of the 1A to 2.0 upgrade is one that everyone would like to forget but haven't. They say a good first step in easing the upgrade burden would be to eliminate sending back diskettes.

Everyone concedes that end-users will drive the decision to upgrade. Such a move will happen on an as needed basis and will rarely be "automatic." Assuming a simplified upgrade process, MIS will not resist upgrading.

People expect a wide range of enhancements in 3.0—faster recalculation speed, linking spreadsheets and keystroke

recording, to name a few—but want them to work within existing memory requirements.

Department managers, in particular, want Release 2.01 to remain available indefinitely. Because the discontinuation of 1A forced many to upgrade at inconvenient times, there is concern about the fate of Release 2.01.

\* \* \*

## EXHIBIT 41

Massachusetts Mutual Life Insurance Company,  
Springfield MA

To: List

Re: Quattro Evaluation

From:

Date: December 9, 1987

A preliminary evaluation of Quattro has been initiated, involving PC App Support, the Info Center, and SDD areas of Respond III and Respond Plus. Some very positive results have evolved during this testing. Quattro seems to be 100% compatible with Lotus 1-2-3 V2.x. Quattro also offers data and process integration with Paradox, MM's database standard.

If Quattro continues to prove to be an attractive alternative to Lotus, upgrades, new purchases, and custom applications may migrate to what appears to be a more powerful and versatile, and yet comparatively inexpensive solution.

Extensive testing by those areas of the company which currently utilize Lotus is needed to assist us in determining the impact of migrating to Quattro as one of our spreadsheet standards. Your specific involvement will be to test your area's current base of 123-related software.

The two key issues which should be addressed include:

Quattro's ability to run macros and templates exactly as they would with Lotus;

Quattro's compatibility with existing systems which access the spreadsheet applications (i.e. menu systems, sales illustrations, etc.)



In addition, general functionality, user interface, and an overall assessment of the product as it relates to your clients' needs should also be considered.

We will contact you by Friday, December 11, 1987 to make arrangements for you to acquire a production copy of Quattro. We would like the evaluation process to be completed by year-end. A meeting will be scheduled in early January to exchange ideas and address issues.

If anyone needs special assistance or further information, please do not hesitate to call me (x3190), Diane Giuliana (x5239) or Bridget Knudsen (x2451).

Thanks

List:	Nancy Crosby	L398
	Susan Gay	A255
	Jim Snyder	L403
	Denise Szczebak	D301
	Elaine Carlson	D296
	Annora Stewart	MMH3
FYI:	Candice Kasai	B060
	Diane Giuliana	B303
	Bridget Knudsen	B303

(Handwritten material illegible)

**Exhibit in Support of Borland International, Inc.'s  
Motion for Reconsideration, dated August 31, 1992  
(Declaration of Andrew Konstantaras (Dkt. No. 200))**

## EXHIBIT I

F9: CALC Recalculate worksheet

F10: GRAPH Draw graph according to most recent graphing specifications

## "1-2-3 COMMANDS"

## "W"orksheet Commands

"G"lobal	Controls over-all settings
"F"ormat	sets the display appearance of numbers
"F"ixed	fixed # of decimal pts., 0-15
"S"cientific	exponential (1.2E+01)
"C"urrency	\$ and commas (\$1,000)
"," (comma)	(1,000.546)
"G"eneral	drops trailing 0 after decimal pt.
"t"/- (graph)	displays ++++ or -----
"P"ercent	divides by 100, shows % (10%)
"D"ate	controls display of date numbers
"1"	(20-Jun-48)
"2"	(20-Jun)
"3"	(Jun-48)
"T"ext	shows formulas as "text" (+B2tC3)
"L"abel-Prefix	controls label alignment in cell
"L"eft	label is preceded by ' (a preceding
"R"ight	label is preceded by " \ creates re-
"C"enter	label is preceded by ^ peating label)
"C"olumn-width	may be 1-72 characters wide
"R"ecalc	controls recalculation options
"N"atural	recalcs formulas in dependency order
"C"olumnwise	recalcs left to right, down columns
"R"owwise	recalcs top to bottom, across rows
"A"utomatic	recalcs every time new entry is made
"M"anual	only recalcs when F9 [CALC] key is pressed
"I"teration	sets # of times recalc occurs
"P"rotection	controls access to protected cells
"E"nable	turns protection on



"D"isable	turns protection off
"D"efault	controls equipment settings
"P"rinter	controls printer options
"I"nterface	choose Serial or Parallel cards
"A"uto-LF	Line Feed after Carriage Return?
"L"eft	margin spaces from edge of page
"R"ight	total # spaces from left edge
"T"op	margin from top of paper
"B"ottom	margin from bottom of paper
"P"age-Length	total # lines on paper
"W"ait	pause after each page?
"S"etup	send special control string
"Q"uit	return to "D"efault submenu
"D"isk	sets initially current disk
"N"one	program disk's drive is current
"A B C D E F G"	specified drive is current
"S"tatus	shows current "D"efault settings
"U"pdate	records changes in "D"efault submenu
"Q"uit	return to "G"lobal submenu
"I"nsert	adds blank, unformatted cells
"C"olumn	
"R"ow	
"D"elete	removes cell contents and formats
"C"olumn	deletes entire column
"R"ow	deletes entire row
"C"olumn-width	sets width of pointer's column
"S"et	sets new width
"R"eset	returns column to "G"lobal setting
"E"rase	erases entire worksheet
"T"itles	keeps title cells visible on screen
"H"orizontal	keeps specified rows visible
"V"ertical	keeps specified columns visible
"B"oth	keeps both rows and columns visible
"C"lear	eliminates all titles
"W"indow	splits the display window in two
"H"orizontal	splits window at pointer's row
"V"ertical	splits window at pointer's column
"S"ync	makes windows scroll together

"U"nsync	lets windows scroll independently
"C"lear	returns to single window display
"S"tatus	shows current "G"lobal settings
"/R"ange Commands	
"F"ormat	sets display appearance of values in range
"F"ixed	fixed # of decimal pts., 0-15
"S"cientific	exponential (1.2E+01)
"C"urrency	\$ and commas (\$1,000)
"," (comma)	(1,000.546)
"G"eneral	drops trailing 0 after decimal pt.
"t"/- (graph)	displays ++++ or ———
"P"ercent	divides by 100, show % (10%)
"D"ate	controls display of date numbers
"1"	(20-Jun-48)
"2"	(20-Jun)
"3"	(Jun-48)
"T"ext	shows formula as "text" (+B2tC3)
"R"eset	returns range to "G"lobal format
"L"abel-Prefix	sets alignment of labels already in range
"L"eft	(')
"R"ight	(")
"C"enter	(^)
"E"rase	erases contents of specified range
"N"ame	gives range addresses a name
"C"reate	assigns name to use instead of addresses
"D"elete	un-names a range
"L"abels	makes label the name of adjacent cell
"L"eft "R"ight "U"p "D"own	
"R"eset	erases all range names
"J"ustify	changes width of text paragraph
"U"nprotect	removes or replaces protection facility
"P"rotect	around cells in range
"I"nput	pointer can only go to unprotected cells

"/C"opy Command		copies range contents to new location(s)
"/M"ove Command		moves range contents to new location
"/F"ile Commands		
"S"ave		sends current worksheet to disk file
"R"etrieve		brings worksheet file from disk to screen
"C"ombine		overlays disk file on current worksheet
"C"opy )	"E"ntire-file	incoming cells replace worksheet's
"A"dd )	"N"amed-Range	overlapping cells contents summed incoming values minus worksheet's
"S"ubtract )		
"X"tract		sends part of current worksheet to disk file
"F"ormula		saves formulas in Xtract
"V"alues		only saves current value of formulas
"E"rase		erases one or more disk files
"W"orksheet		erases worksheet (.WK5) file(s)
"P"rint		erases print (.PPN) file(s)
"G"raph		erases graph/picture (.PIC) file(s)
"L"ist		lists names of files, shows free disk memory
"W"orksheet		lists worksheet (.WK5) files on current disk
"P"rint		lists all print (.PPN) files on disk
"G"raph		lists graph/picture (.PIC) files on disk
"I"mport		brings print/text (.PPN) disk file to screen
"T"ext		only brings text from disk to screen
"N"umbers		brings numbers and "quoted" text to screen

"D"isk	switches current disk drive
"/P"rint Commands	
("P"rinter)	sends worksheet to printer
("F"ile)	"prints" worksheet in print (.PPN) file
"R"ange	sets the range to be printed
"L"ine	advances printer one blank line
"P"age	advances printer to top of next page
"O"ptions	controls appearance of printed page
"H"eader	inserts extra characters at top and/or bottom of printed page
"F"ooter	
"M"argins	controls blank space at edges of paper
"L"eft "R"ight	"T"op "B"ottom
"B"orders	prints specified columns/rows along left side and/or at top of each page of range being printed
"C"olumns	
"R"ows	
"S"etup	sends special control characters to printer
"P"age-Length	tells 1-2-3 total # of lines on page
"O"ther	
"A"s-Displayed	printout copies screen display
"C"ell-Formulas	printout shows formula text, not values
"U"nformatted	suppresses/reactivates the use of headers, footers & page breaks
"F"ormatted	
"Q"uit	return to main print menu
"C"lear	eliminates/resets print settings to "/WGD"
"R"ange	"forgets" last specified range
"B"orders	cancels repeating borders
"F"ormat	resets page-length; margins, set-up string
"A"ll	resets all of above to global default values
"A"lign	signifies that paper has been repositioned
"G"o	prints the selected range with options
"Q"uit	return to Ready Mode

## "/G"raph Commands

"T"ype	selects type of graph displayed
"L"ine	graphs 1 to 6 series of numbers
"B"ar	graphs 1 to 6 series of numbers
"X"Y	graphs relationship of 2 series of numbers
"S"tacked-Bar	graphs numbers in proportion to their sum
"P"ie	graphs one series of numbers in prop. to sum
"X A B C D E G"	defines label and data ranges for graphs
"R"eset	returns settings to default values
"G"raph	erases current graph's specifications
"X A B C D E F G"	removes range contents from current graph
"Q"uit	return to main "/G"raph menu
"V"iew	display current graph on screen
"S"ave	saves current graph specs in disk file
"O"ptions	
"L"egend	labels each data range
"A B C D E F"	
"F"ormat	sets method of displaying/connecting
"G"raph )	data points for entire graph or
"A" )	"L"ines individual data ranges
"B" )	"S"ymbols
"C" )	"B"oth
"D" )	"N"either
"E"	
"F"	
"Q"uit	return to main "/G"raph menu
"T"itles	sets title for axes and/or graph
"F"irst	when printed, 1st graph title is double-sized
"S"econd	second line of graph title
"X"-axis	titles horizontal axis
"Y"-axis	titles vertical axis
"G"rid	displays scale lines across graph

"H"orizontal	displays horizontal lines at tick marks
"V"ertical	displays vertical lines at tick marks
"B"oth	displays both horizontal and vertical lines
"C"lear	erases all grid lines
"S"cale	sets display scale of axes
("X"-axis)	only relevant for XY graphs
("Y"-axis)	not used with pie graphs
"A"utomatic	includes min. and max. data values
"M"anual	focuses in on particular area of concern
"L"ower	with manual scaling, sets lower scale value
"U"pper	with manual scaling, sets upper scale value
"F"ormat	sets format of scaling numbers
"F"ixed	fixed # decimal pts., 0-15
"S"cientific	exponential (1.2E+01)
"C"urrency	\$ and commas (\$1,000)
"," (comma)	(1,000.546)
"G"eneral	drops trailing 0 after decimal pt.
"t"/- (graph)	displays ++++ or ———
"P"ercent	divides by 100, shows % (10%)
"D"ate	controls display of date numbers
"1"	(20-Jun-48)
"2"	(20-Jun)
"3"	(Jun-48)
"T"ext	shows formula as "text" (+B2tC3)
"Q"uit	return to options submenu
"C"olor	displays graph bars, lines, symbols in color
"B"&W	displays graph bars, lines, symbols in b&w
"D"ata-labels	sets cells to label graphed data-points
"A B C D E F"	specifies data range to be labeled
"Q"uit	return to options submenu
"Q"uit	return to main graph menu



"N"ame	names graph specs to be saved/ retrieved
"C"reate	names and saves current specifica- tions
"U"se	retrieves named graph, even if data is changed
"D"elete	removes name (forgets) specified graph specs
"R"eset	eliminates all graph spec. names
"Q"uit	return to Ready Mode
"/D"ata Commands	
"F"ill	fills range with incremented numbers
"T"able	shows how dif. entries affect formula values
"1"	puts series of values in series of for- mulas
"2"	puts 2 series of values in one formula
"S"ort	sorts a list or database of entries
"D"ata-Range	range whose rows (records) will be sorted
"P"rimary-Key	the column (field) used as 1st basis of sort
"S"econdary-Key	the column (field) used a 2ndary basis of sort
"R"eset	cancels specified data-range and sort keys
"G"o	triggers the sort
"Q"uit	return to main "/D"ata menu
"Q"uery	performs operations on a database
"I"nput	specifies the input range
"C"riterion	specifies the criterion range
"O"utput	specifies the output range
"F"ind	finds data that meets criterion
"E"xtract	copies criteria-specified data to out- put range
"D"elete	erases criteria-specified data from database

"U"nique	copies one copy of each record in output range
"R"eset	cancels input, criterion & output range specs.
"Q"uit	return to Ready Mode
"D"istribution	calculates frequency distribution of values
"/Q"uit Command	
leave 1-2-3, return to Access or DOS	

## GRAPH PROGRAM COMMANDS

"S"elect	selects graphs for printing
"O"ptions	selects formatting options for graphs
"C"olor	assigns colors to parts of graphs
"G"rid	assigns color to gridwork and text
"A"	assigns color to data range A
"B"	assigns color to data range B
"C"	assigns color to data range C
"D"	assigns color to data range D
"E"	assigns color to data range E
"F"	assigns color to data range F
"Q"uit	exits Color submenu
"B"lack	
"R"ed	
"O"range	
"Y"ellow	
"G"reen	possible colors for each data range
"B"lue	
"P"urple	
"B"rown	
"F"ont	selects fonts for graphs
"1"	selects font for 1st line of text (will be used for rest of graph if no font 2 is specified)
"2"	selects font for rest graph
"S"ize	controls size and placement of graph
"F"ull	produces full-page graph
"H"alf	produces half-page graph

"M"anual	adjusts size settings manually
"L"eft	controls left margin
"T"op	controls top margin
"W"idth	controls width of graph
"H"eight	controls height of graph
"R"otation	controls rotation of graph
"Q"uit	exits Size submenu
"P"ause	controls pause between printing graphs
"E"ject	controls page eject between printing graphs
"Q"uit	exits Options menu
"G"o	prints selected graphs
"C"onfigure	configures GRAPH to system hardware
"F"iles	selects drives to search for files
"P"ictures	selects drive to search for Picture files
"F"onts	selects drive to search for Font files
"Q"uit	exits Files submenu
"D"evice	selects graphics device for printing
"1"	selects Epson MX-80/100 (single) as device
"2"	selects Epson MX-80/100 (double) as device
"3"	selects IDS Prism printer as device
"4"	selects HP 7470A plotter as device
"P"age	selects default page size
"L"ength	selects default page length
"W"idth	selects default page width
"Q"uit	exits Page submenu
"I"nterface	selects interface for graphics device
"P1"	First Parallel interface (LPT1:)
"S1"	First Serial interface (COM1:)
"P2"	Second Parallel interface (LPT2:)
"S2"	Second Serial interface (COM2:)
"S"ave	record configuration on disk
"C"ancel	cancel Save

"R"eplace	replace old configuration with new
"R"eset	resets "unsaved" configuration settings to default
"Q"uit	exits Configure submenu
"A"lign	make current paper position "top of form"
"P"age	advance paper to top of next page
"Q"uit	exit GRAPH program
"Y"es	exit from GRAPH to DOS or LOTUS ACCESS SYSTEM
"N"o	return to GRAPH program

## "@ FUNCTIONS"

## "Mathematical Functions"

@ABS(x)	absolute value
@ACOS(x)	arc cosine
@ASIN(x)	arc sine
@ATAN(x)	2-quadrant arc tangent
@ATAN2(x, y)	4-quadrant arc tangent
@COS(x)	cosine
@EXP(x)	exponential
@INT(x)	integer part

**Documentary Exhibits submitted at Trial,  
filed May 5, 1993  
(Dkt. No. 359)**



J.A. 899

EXHIBIT 7

QUATTRO PRO 3.0 USER'S GUIDE

SUPERIOR SPREADSHEET POWER

BORLAND

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APPENDIX

Commands in Lotus 1-2-3  
and the Quattro Pro equivalents

The table in this appendix lists the commands in Lotus 1-2-3, identifying the corresponding commands in Quattro Pro. You can use it to adjust to the Quattro Pro menu tree. For example, if you know where a command is in 1-2-3, but you don't know the equivalent command in Quattro Pro, you can look it up here.

Table I.1: Commands in 1-2-3 and their Quattro Pro equivalents

Command in 1-2-3 v. 2.01	Quattro Pro command
<b>WORKSHEET</b>	
<b>Global</b>	
Format	/Options   Formats   Numeric Format
Label Prefix	/Options   Formats   Align Labels
Column Width	/Options   Formats   Global Width
Recalculation	/Options   Recalculation
Natural	/O   R   Order   Natural
Columnwise	/O   R   Order   Columnwise
Rowwise	/O   R   Order   Rowwise
Automatic	/O   R   Mode   Automatic
Manual	/O   R   Mode   Manual
Background	/O   R   Background
Iteration	/O   R   Iteration
Protection	/Options   Protection
Default	
Printer	
Interface	/Options   Hardware   Printers   1st (or 2nd) Printer   Device
Auto LF	/Options   Hardware   Printers   Auto LF
Left	/Print   Layout   Margins   Left
Right	/Print   Layout   Margins   Right
Top	/Print   Layout   Margins   Top
Bottom	/Print   Layout   Margins   Bottom
Page Length	/Print   Layout   Margins   Page Length
Wait	/Options   Hardware   Printers   Single Sheet
Setup	/Print   Layout   Setup String
Name	/Options   Hardware   Printers   Default Printer
Directory	/Options   Startup   Directory
Status	
Update	/Options   Update
Other	
International	/Options   International
Punctuation	/Options   International   Punctuation
Currency	/Options   International   Currency
Date	/Options   International   Date
Time	/Options   International   Time
Help	
Clock	/Options   Other   Clock
Zero	/Options   Formats   Hide Zeros

Table I.1: Commands in 1-2-3 and their Quattro Pro equivalents (continued)

Command in 1-2-3 v. 2.01	Quattro Pro command
<b>WORKSHEET</b>	
<b>Insert</b>	
Column	/Edit   Insert   Columns
Row	/Edit   Insert   Rows
<b>Delete</b>	
Column	/Edit   Delete   Columns
Row	/Edit   Delete   Rows
<b>Column</b>	
Set Width	/Style   Column Width
Reset Width	/Style   Reset Width
Hide	/Style   Hide Column   Hide
Display	/Style   Hide Column   Expose
Erase	/File   Erase
Titles	/Window   Options   Locked Titles
<b>Window</b>	
Horizontal	/Window   Options   Horizontal
Vertical	/Window   Options   Vertical
Sync	/Window   Options   Sync
Unsync	/Window   Options   Unsync
Clear	/Window   Options   Clear
<b>Status</b> (display only—commands listed will change these settings)	
Normal Memory	/Options   Hardware
Expanded Memory	/Options   Hardware
Co-Processor	/Options   Hardware
Recalc Mode	/Options   Recalculation   Mode
Recalc Order	/Options   Recalculation   Order
Iterations	/Options   Recalculation   Iteration
Circular Reference	/Options   Recalculation   Circular Cell
Cell Format	/Options   Formats   Numeric Format
Label Prefix	/Options   Formats   Align Labels
Column Width	/Options   Formats   Global Width
Suppress Zero	/Options   Formats   Hide Zeros
Protection	/Options   Protection
Macro Library	/Tools   Macro   Library
Page	/Style   Insert Break

Table 1.1: Commands in 1-2-3 and their Quattro Pro equivalents (continued)

Command in 1-2-3 v. 2.01	Quattro Pro command
<b>RANGE</b>	
Format	/Style   Numeric Format
Label	/Style   Alignment
Left	/Style   Alignment   Left
Right	/Style   Alignment   Right
Center	/Style   Alignment   Center
Erase	/Edit   Erase Block
Name	/Edit   Names
Create	/Edit   Names   Create
Delete	/Edit   Names   Delete
Labels	/Edit   Names   Labels
Reset	/Edit   Names   Reset
Table	/Edit   Names   Make Table
Justify	/Tools   Reformat
Protect	/Style   Protection   Enable
Unprotect	/Style   Protection   Disable
Input	/Database   Restrict Input
Value	/Edit   Values
Transpose	/Edit   Transpose
<b>COPY</b>	/Edit   Copy
<b>MOVE</b>	/Edit   Move
<b>FILE</b>	
Retrieve	/File   Retrieve
Save	/File   Save
Combine	/Tools   Combine
Copy	/Tools   Combine   Copy
Entire File	/Tools   Combine   Copy   File
Named Range	/Tools   Combine   Copy   Block
Add	/Tools   Combine   Add
Entire File	/Tools   Combine   Add   File
Named Range	/Tools   Combine   Add   Block
Subtract	/Tools   Combine   Subtract
Entire File	/Tools   Combine   Subtract   File
Named Range	/Tools   Combine   Subtract   Block
Xtract	/Tools   Xtract
Erase	/Edit   Erase (in a File Manager window)
Worksheet	
Print	
Graph	
Other	

Table 1.1: Commands in 1-2-3 and their Quattro Pro equivalents (continued)

Command in 1-2-3 v. 2.01	Quattro Pro command
<b>FILE</b>	
List	/Sort (in a File Manager window)
Worksheet	
Print	
Graph	
Other	
Import	/Tools   Import
Text	/Tools   Import   ASCII Text File
Numbers	/Tools   Import   Comma & "" Delimited File
Comma	/Tools   Import   Comma & "" Delimited File
Directory	/File   Directory
<b>PRINT</b>	
Printer	/Print   Destination   Printer
Range	/Print   Block
Line	/Print   Adjust Printer   Skip Line
Page	/Print   Adjust Printer   Form Feed
Options	/Print   Layout
Header	/Print   Layout   Header
Footer	/Print   Layout   Footer
Margins	/Print   Layout   Margins
Left	/Print   Layout   Margins   Left
Right	/Print   Layout   Margins   Right
Top	/Print   Layout   Margins   Top
Bottom	/Print   Layout   Margins   Bottom
Borders	/Print   Headings
Columns	/Print   Headings   Top Heading
Rows	/Print   Headings   Left Heading
Setup	/Print   Layout   Setup String
Pg Length	/Print   Layout   Margins   Page Length
Other	
As Displayed	/Print   Format   As Displayed
Cell Formulas	/Print   Format   Cell Formulas
Formatted	/Print   Layout   Break Pages   Yes
Unformatted	/Print   Layout   Break Pages   No
Update	/Print   Layout   Update
Clear	/Print   Layout   Reset
All	/Print   Layout   Reset   A/
Range	/Print   Layout   Reset   Print Block
Borders	/Print   Layout   Reset   Borders
Format	/Print   Layout   Reset   Layout
Align	/Print   Adjust Printer   Align
Go	/Print   Spreadsheet Print
File	/Print   Destination   File
(same options as /Print   Printer)	



Table 1.1: Commands in 1-2-3 and their Quattro Pro equivalents (continued)

Command in 1-2-3 v. 2.01	Quattro Pro command
<b>GRAPH</b>	
Type	/Graph   Graph Type
X	/Graph   Series   X-Axis Series
A - F	/Graph   Series   1st - 6th Series
Reset	
Graph	/Graph   Customize Series   Reset   Graph
X	/G   C   Reset   X-Axis
A - F	/G   C   Reset   1st - 6th Series
View	/Graph   View
Save	/Print   Graph Print   Write Graph File
Options	
Legend	/Graph   Text   Legends
A - F	/Graph   Text   Legends   1st - 6th Series
Format	/G   C   Markers & Lines   Formats
Graph	/G   C   M   Formats   Graph
A - F	/G   C   M   Formats   1st - 6th Series
Markers	/G   C   Markers & Lines   Markers
A-F	/G   C   M   Markers   1st - 6th Series
Titles	/Graph   Text
First	/Graph   Text   1st Line
Second	/Graph   Text   2nd Line
X-Axis	/Graph   Text   X-Title
Y-Axis	/Graph   Text   Y-Title
Grid	/Graph   Overall   Grid
Scale	
Y-Scale	/Graph   Y-Axis
Automatic	/Graph   Y-Axis   Scale   Automatic
Manual	/Graph   Y-Axis   Scale   Manual
Lower	/Graph   Y-Axis   Low
Upper	/Graph   Y-Axis   High
Format	/Graph   Y-Axis   Format of Ticks
Indicator	/Graph   Y-Axis   Display Scaling
X-Scale	/Graph   X-Axis
Automatic	/Graph   X-Axis   Scale   Automatic
Manual	/Graph   X-Axis   Scale   Manual
Lower	/Graph   X-Axis   Low
Upper	/Graph   X-Axis   High
Format	/Graph   X-Axis   Format of Ticks
Indicator	/Graph   X-Axis   Display Scaling
Scale	
Skip	
Color	/Graph   Overall   Color/B&W   Color
B&W	/Graph   Overall   Color/B&W   B&W
Data Labels	/Graph   Customize Series   Interior Labels
A - F	/G   C   Interior Labels   1st - 6th Series
Update	/Graph   Customize Series   Update

Table 1.1: Commands in 1-2-3 and their Quattro Pro equivalents (continued)

Command in 1-2-3 v. 2.01	Quattro Pro command
<b>GRAPH</b>	
Name	/Graph   Name
Use	/Graph   Name   Display
Create	/Graph   Name   Create
Delete	/Graph   Name   Erase
Slide	/Graph   Name   Slide
Reset	/Graph   Name   Reset
<b>DATA</b>	
Fill	/Edit   Fill
Table	/Tools   What-If
1	/Tools   What-If   1 Variable
2	/Tools   What-If   2 Variables
Reset	/Tools   What-If   Reset
Sort	/Database   Sort
Data Range	/Database   Sort   Block
Primary Key	/Database   Sort   1st Key
Secondary Key	/Database   Sort   2nd Key
Reset	/Database   Sort   Reset
Go	/Database   Sort   Go
Query	/Database   Query
Input	/Database   Query   Block
Criterion	/Database   Query   Criteria Table
Output	/Database   Query   Output Block
Assign Names	/Database   Query   Assign Names
Find	/Database   Query   Locate
Extract	/Database   Query   Extract
Unique	/Database   Query   Unique
Delete	/Database   Query   Delete
Reset	/Database   Query   Reset
Distribution	/Tools   Frequency
Matrix	
Invert	/Tools   Advanced Math   Invert
Multiply	/Tools   Advanced Math   Multiply
Regression	/Tools   Advanced Math   Regression
X-Range	/T   A   Regression   Independent
Y-Range	/T   A   Regression   Dependent
Output Range	/T   A   Regression   Output
Intercept	/T   A   Regression   Y Intercept
Reset	/T   A   Regression   Reset
Go	/T   A   Regression   Go

Table I.1: Commands in 1-2-3 and their Quattro Pro equivalents (continued)

Command in 1-2-3 v. 2.01	Quattro Pro command
<b>DATA</b>	
Parse	/Tools   Parse
Format Line	
Create	/Tools   Parse   Create
Edit	/Tools   Parse   Edit
Input Column	/Tools   Parse   Input
Output Range	/Tools   Parse   Output
Reset	/Tools   Parse   Reset
Go	/Tools   Parse   Go
<b>SYSTEM</b>	
OS	/File   Utilities   DOS Shell
<b>QUIT</b>	/File   Exit

## Quattro: Natural Evolution



1970  
HAND-HELD CALCULATOR

1979  
VICALC™

1982  
LOTUS 1-2-3™

1987  
QUATTRO™

### Quattro: The Professional Spreadsheet

FEATURE	QUATTRO	LOTUS 2.01
<b>SPEED</b>		
ReCalc Cash Flow Model (5K cells)	.27 sec.	2.90 sec.
Delete Row 15K cells (ReCalc Time)	.78 sec.	2.38 sec.
Load File (15K cells)	16.9 sec.	19.8 sec.
Page Down (A1 to A1000)	12.2 sec.	17.4 sec.
Presentation-quality Graphics	YES	NO
<b>GRAPHICS</b>		
Graph Types	18	6
Integrated Graph Printing	YES	NO
Full Graph Customization	YES	NO
On-Screen Font Styles	11	1
PostScript Support	YES	NO
<b>VERSATILITY</b>		
User-modifiable Menus	YES	NO
Menu Shortcuts	YES	NO
Pull-down menus	YES	NO
Point and Press Editing	YES	NO
Automatic Installation	YES	NO
Macro Learn Mode	YES	NO
<b>POWER</b>		
Maximum Number of Macros	Unlimited	27
Single Step Macro Debugging Environment	YES	NO
Price	\$189.95	\$495

60-Day Money-Back Guarantee\*

Benchmark details available upon request.

*Get Quattro, the professional spreadsheet for only \$199.95*

Quattro is so advanced it's easy to use and it's less than half the price of 1-2-3. It's fully compatible with all your existing 1-2-3 files and macros—but it makes everything in them look better, print better and makes your work go faster.

For the dealer nearest you, a brochure, or to order now, Call (800) 543-7543



For the IBM PS/2 and the IBM family of personal computers and all IBM compatibles

# QUATTRO

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503897



Borland's New Professional Spreadsheet

# Quattro: Twice the speed. Twice the power. Half the price.

**Q**uattro™, our new professional spreadsheet, proves there are better and faster ways to do everything. To do graphics. To recalculate. To do macros. To save and retrieve. To search, sort, load. To do anything and everything that state-of-the-art spreadsheets should do.

## *Quattro gives you presentation-quality graphics*

Quattro brings new highs in quality graphics to your spreadsheet. It also brings Postscript™ support and new variety and diversity to the kinds of graphs and graphics you can produce from your spreadsheet, and you can produce hard copy of your graphics—With either printer or plotter—without leaving the spreadsheet. All you do is hit "Print." Quattro makes it easy to get hard copy—and you don't have to buy a separate graphics program.

## *Quattro recalculates much faster than you-know-who*

The smartest and fastest way to recalculate a spreadsheet is to do what Quattro does, something called "intelligent recalc," which in English means you only re-count the numbers that count.

In a spreadsheet, not all numbers are born equal and changing one number doesn't always change everything, so Quattro recalculates just the formulas that matter, not all the formulas it knows. (You wouldn't reshoot a whole movie just because you changed one scene, but unfortunately, that's the way 1-2-3 does it—and that's why it takes so long.)

## *Quattro demystifies Macros and makes your work go faster*

Using macros—electronic shortcuts—is easy with Quattro. Quattro offers a complete macro debugging environment as you "single-step" through your macros and record them as you work.

## *If you know how to use 1-2-3, you know how to use Quattro*

You don't have to learn a whole new program. Quattro works directly with all 1-2-3 file formats. No importing/exporting or macro translation is required. Quattro can also load and save ASCII, Paradox™, and dBASE™ files.

Compatible with 1-2-3? Yes.

Faster than 1-2-3? Yes.

Technically superior to 1-2-3? Yes.

Half the price of 1-2-3? Yes!

## *Quattro includes SQZ!™ Plus data compression*

A special implementation of SQZ!™ Plus, the spreadsheet file compression utility, is built into Quattro and comes to you absolutely free! SQZ!™ Plus for Quattro automatically compacts and expands Quattro spreadsheets by up to 95% during file saving and retrieving.

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503898

PLAINTIFF'S EXHIBIT 18

[WESTERN UNION]

BORLAND INTERNATIONAL  
P. O. BOX 1866  
SANTA CRUZ, CA 95061-1866

004899

HENRY GUTMAN  
OSULLIVAN GRAEV KARABEL  
30 ROCKEFELER PLZ  
NEW YORK, NY 10112

RECENTLY WE OFFERED YOU THE CHANCE TO UPGRADE\* TO QUATTRO® PRO—BORLAND'S EXTRAORDINARY NEXT-GENERATION SPREADSHEET— FOR THE LIMITED-TIME PRICE OF \$99.95. IN CASE YOU MISSED OUR MAILING, WE'D NOW LIKE TO GIVE YOU ONE MORE CHANCE TO ORDER THIS \$495 PROGRAM AT OUR SPECIAL PRICE.

WE HAVE EXTENDED OUR DEADLINE TO AUGUST 30, 1990. UNTIL THEN, YOU CAN STILL PAY JUST \$99.95 FOR A SPREADSHEET THAT OFFERS YOU:

- EXCEPTIONAL COMPATIBILITY WITH LOTUS® 1-2-3®. USE THE SAME COMMANDS AND MACROS AS YOU WOULD IN 1-2-3. QUATTRO PRO WILL ALSO READ, WRITE AND LOAD EVEN THE LARGEST FILES CREATED WITH 1-2-3 RELEASES 1A AND 2.01.
- MULTI-PAGE SPREADSHEET CONSOLIDATION. USE "HOT LINKS" TO COMBINE INFORMATION FROM UP TO 64 LOADED AND UNLOADED SPREADSHEETS WITHOUT CUTTING AND PASTING.
- ADVANCED SPREADSHEET PUBLISHING. QUATTRO PRO CONTAINS PUBLISHING FEATURES RIVALING

J.A. 910

THOSE OF EXPENSIVE, STAND-ALONE GRAPHICS PACKAGES.

BEST OF ALL, QUATTRO PRO COMES WITH A 60-DAY MONEY-BACK GUARANTEE.

IF YOU HAVE ALREADY RESPONDED TO OUR INITIAL OFFER, PLEASE EXCUSE US FOR CONTACTING YOU AGAIN. BUT IF YOU HAVE NOT, REMEMBER, YOU ONLY HAVE UNTIL AUGUST 30, 1990 TO UPGRADE TO THIS \$495 PROGRAM FOR JUST \$99.95. I URGE YOU TO ORDER QUATTRO PRO TODAY.

PHILIPPE KAHN  
PRESIDENT, BORLAND INTERNATIONAL

-----  
TO ORDER: RETURN THIS FORM IN THE ENCLOSED ENVELOPE. FOR FASTER SERVICE CALL US TOLL-FREE AT 1 (800) 331-0877. OR VISIT ANY PARTICIPATING SOFTWARE DEALER.\*

HENRY GUTMAN                      ELIGIBILITY # 59124569 QP97  
OSULLIVAN GRAEV KARABEL  
30 ROCKEFELER PLZ  
NEW YORK, NY 10112

IMPORTANT! PLEASE INDICATE DISK SIZE: ( ) 3 1/2"  
( ) 5 1/4"

QUATTRO PRO                      \$99.95

STATE SALES TAX\*\*                      \_\_\_\_\_

SHIPPING                      5.00

TOTAL                      \$ \_\_\_\_\_

( ) BILL ME ( ) CHECK ENCLOSED

( ) MASTERCARD ( ) VISA ( ) AMEX

CARD # \_\_\_\_\_-\_\_\_\_\_-\_\_\_\_\_-\_\_\_\_\_

EXPIRATION DATE \_\_\_\_\_-\_\_\_\_\_

\*Eligibility limited to current orders of 1-2-3, Symphony®, Excel®, or SuperCalc®. You will be required to show proof of ownership after receiving Quattro Pro. To qualify at retail, present an original

J.A. 911

manual page or disk from any version of 1-2-3, Symphony, SuperCalc or Excel.

\*\* Applicable in: CA, CT, GA, IL, MA, MI, NY, OH, PA, TX, VA, WA.

Purchase orders: Attach this certificate to a preprinted P. O. form.

Terms: Net 30 days. Point of shipment: Scotts Valley, CA. Subject to approval.



## PLAINTIFF'S EXHIBIT 19

BORLAND SCHOLAR  
PROGRAM-INSTRUCTOR COUPON

\* \* \*

BORLAND SCHOLAR PROGRAM  
1800 Green Hills Road, P. O. Box 660001  
Scotts Valley, CA 95067-0001

September 6, 1990

Instructor Certificate #:  
60214167Ms. Dorothy Konrad  
English  
Barat College  
Lake Forest, IL 60045

Dear Ms. Konrad:

Several months ago we introduced QUATTRO®PRO, the next-generation spreadsheet that's being hailed as the best ever by educators, the computer industry, and major corporations.

Because you are a valued member of the educational community, Borland is making you a very special offer:

For a limited time, you can order the complete \$495 version of QUATTRO PRO for only \$69.95. That's more than 85% off the regular retail price.

Best of all, this offer is 100% risk-free. Your QUATTRO PRO includes our standard 60-day, money-back guarantee.

And, because we want to extend this extraordinary value to your students, we've enclosed four Student Discount Certificates, good for the same special deal. (Additional Student Coupons are available on request).

Most likely, you and your students are currently using Lotus® 1-2-3®. And if you're reluctant to change, I understand.

That's why we've made QUATTRO PRO fully compatible with 1-2-3 version 2.01 file formats. You can adapt your copy of QUATTRO PRO to be compatible with the commands and macros familiar to 1-2-3 users, and best of all, run all your existing courseware with virtually no modification.

Furthermore, QUATTRO PRO offers you and your students the most important advanced features of 1-2-3 (versions 2.2 and 3.0), Excel®, and Supercalc® all in a single program without requiring you to purchase expensive new PC hardware. These features include:

- Advance spreadsheet publishing. Turn your numbers into exciting charts and graphs, which can be electronically linked and pasted into your spreadsheet. Embellish your work with publishing features built-in drawing tools; color, shading, and patterns; text in different sizes and styles (including nine Bitstream™ fonts), and the PicturePak™ clip-art library that rival those of expensive stand-alone graphics packages. Then link your graphs and charts into a single integrated slide presentation.
- Powerful analytical tools. QUATTRO PRO is the first spreadsheet that, by itself, meets the rigorous requirements of the business academic community, offering linear programming, regression analysis, matrix mathematics, and X/Y logarithmic graphing.
- Multi-page spreadsheet consolidation. Take any cells in the spreadsheet you're using and create "hot links" to cells in up to 64 other spreadsheets whether loaded in RAM or on disk. This means you can reference any cell from any spreadsheet from any formula you're working in. When you make a change in one cell, it's immediately reflected in all the other linked cells.

J.A. 914

How can QUATTRO PRO do all this on an ordinary PC? The secret lies in Borland's new patent-pending VROOMM technology. VROOMM (Virtual Runtime Object-Oriented Memory Manager) intelligently directs QUATTRO PRO to load only the program components you're likely to need as you work. This leaves you enough memory to build and handle large, complex spreadsheets without sacrificing excellent performance.

We at Borland believe that QUATTRO PRO's analytical and presentation abilities have the power to revolutionize education. But why not find out for yourself?

Simply complete and return the enclosed Instructor Discount Coupon, or call 1-800-331-0877. You'll receive the complete \$495 program—including our risk-free guarantee—for just \$69.95. All we ask is that we receive your order before October 31, 1990.

Don't miss this once-in-a-lifetime chance to put you and your students on the leading edge of spreadsheet technology for only \$69.95 Order your specially priced copy of QUATTRO PRO today.

Cordially,

/s/ PHILIPPE KAHN

Philippe Kahn

President, Borland International, Inc.

P.S. Remember, Borland is backing this offer with a 60-day money-back guarantee. If for any reason QUATTRO PRO doesn't completely satisfy you call us and we'll arrange a full refund. You risk absolutely nothing and have so much to gain!

J.A. 915

PLAINTIFF'S EXHIBIT 32

Date: Fri Jul 31, 1992 5:42 pm

TO: Dave Anderson / 350-9162

TO: John Santee / 436-7190

CC: Robert Warfield / 359-9158

CC: Keith Davis / 424-9795

CC: Tom Burbage / 421-7558

Subject: CR4314

The following is a Deferred bug with CROM. Do we need to fix it before the new Quattro Pro 4.0 disk set is created?

CR4314—New Crom feature have not been added to the "phantom" 123 menu attached to QUATTRO.MU. Macros that access new Crom features run properly using 123.MU, but not with QUATTRO.MU loaded and <Tools><Macro><Keyreader> set to <Yes>.

J.A. 916

PLAINTIFF'S EXHIBIT 33

CONFIDENTIAL  
Internal Bug Report

This Information is for Borland International Internal Use  
Only

Product: Quattro Pro 4.0i (CROM)

Program Area: Macro  
Keyword: Key Reader  
Found By: Tom Burbage  
Submitted By: Tom Burbage  
Reported From: QA  
Date Reported: 2/12/92  
Best: No  
IBR Number: CR 4314  
Status: Open  
Category: C  
Priority: 2  
Version #: 4  
Build #: Build .147  
Attachments: None  
Tech Note: No

Brief Description:

New Crom features have not been added to the "phantom" 123 menu attached to QUATTRO.MU. Macros that access new Crom features run properly using 123.MU, but not with QUATTRO.MU loaded and <Tools><Macro><KeyReader> set to <Yes>. Example below.

Steps to Reproduce

- 1) Alt: '/wgdpg
- 2) /<Options><Startup><MenuTree>123
- 3) <Shift-F2><Alt-F2>Alt<Enter> ;<SpaceBar> to step through; <Break>

J.A. 917

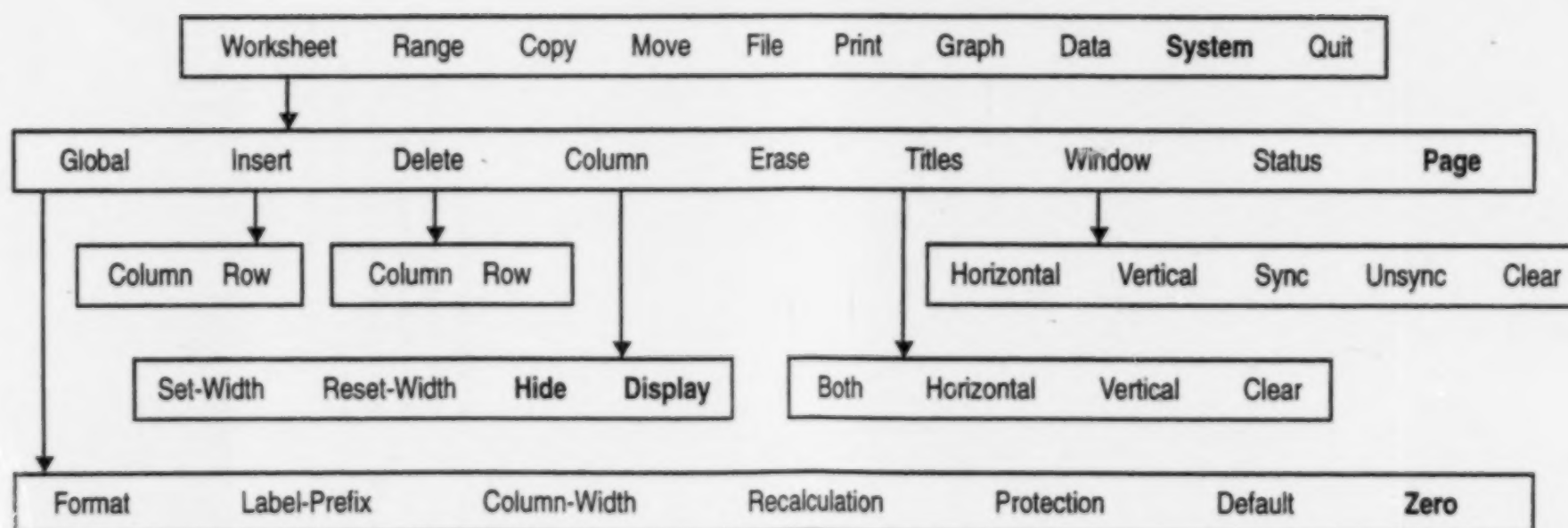
- 4) /<Worksheet><Global><Default><Files><MenuTree>  
QUATTRO
- 5) /<Tools><Macro><KeyReader><Yes>
- 6) Repeat step 3

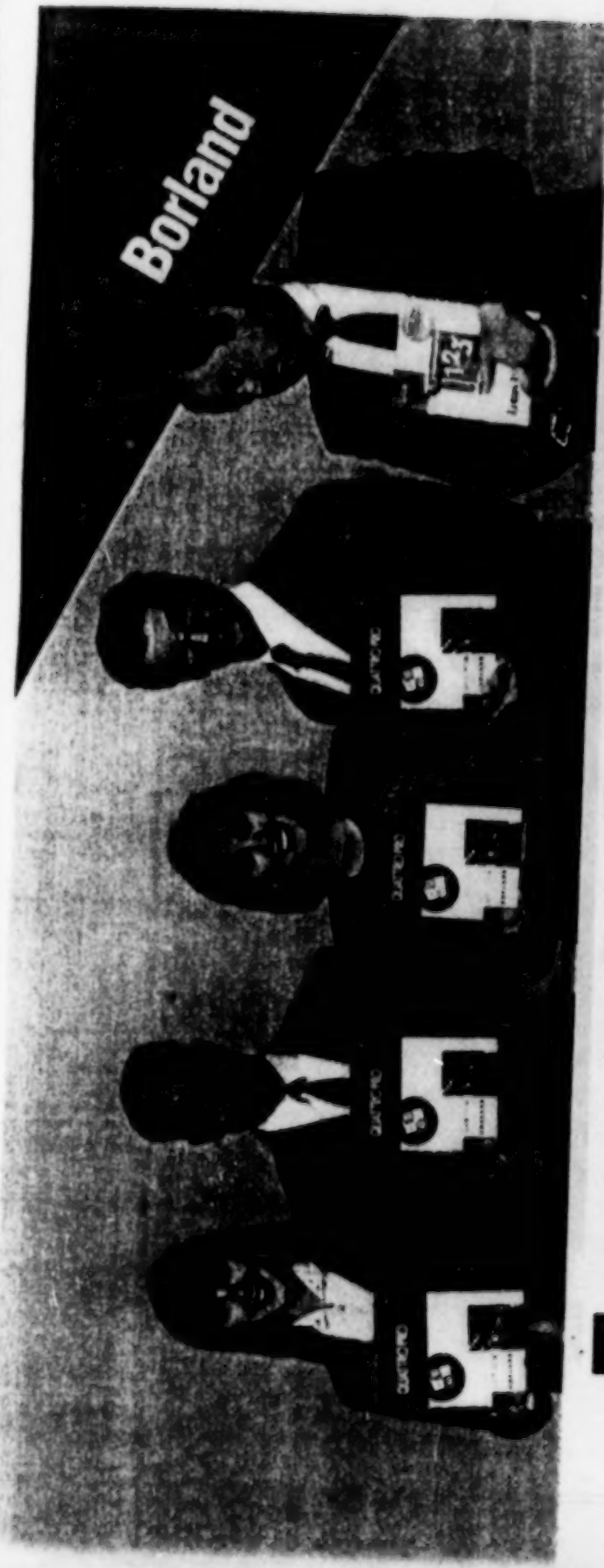
Resolution Information

Resolution:  
Programmer:  
Verification:  
QA Engineer:  
Resolved in Build:  
Date Resolved:  
Verified in Build:  
Date Verified:



**LOTUS COMMAND TREE**  
(Portion of P. 139 of Plaintiff's Trial Exhibit No. 36, Dkt. No. 359;  
Dybvig, Philip H., The Lotus Tutorial)





# Four out of five 1-2-3 users prefer Quattro Pro

When a group of Lotus 1-2-3 users compared Quattro® Pro 4.0 and 1-2-3 side-by-side, they made a startling discovery: four out of five Lotus users preferred Quattro Pro. They found it easier to use, richer in features, and more productive. The study was done by Usability Sciences Corporation, a highly regarded independent testing laboratory. (Coincidentally, this is the same company Lotus uses to do its usability studies.)

## Borland dumps old Lotus menus, keeps macro compatibility

About 90% of Quattro Pro users use only the Quattro Pro native menus. They no longer use the old Lotus slash key. And it's now obvious that Lotus doesn't want other companies supporting its outdated user interface either. Therefore, Borland has decided to give users what they prefer. Borland is now shipping Quattro Pro 4.0 with only the more efficient native menu—the ones users love. And Quattro Pro still has 1-2-3 file, publishing style, and macro compatibility.

## The final mistake: Lotus goes it alone

Lotus' latest strategy of closing the menu-command standard is the final blow to users. After all, what is Lotus known for? *The best technology?* Certainly not. *The best spreadsheet?* Not even close. *Litigation rather than innovation?* Absolutely. And now Lotus is on the verge of losing its largest asset: users who have invested in the Lotus

**Quattro Pro 4.0 is...**  
 ...the best DOS spreadsheet you can buy.  
*PC Computing, March 1992*  
 ...the ultimate DOS spreadsheet.  
*PC Magazine, April 24, 1992*  
 ...the best non-Windows spreadsheet...  
*PC World, March 1992*  
 ...the best DOS spreadsheet ever.  
*Office Technology Management, February 1993*  
 The best DOS spreadsheet in the world.  
*PC User (U.K.), March 24, 1992*

## Lotus and Ashton-Tate: history repeats itself

Ashton-Tate® tried to establish a closed standard too. They tried to force users into their camp and to keep out the competition through litigation. Borland's acquisition of Ashton-Tate reversed this. Borland dropped Ashton-Tate's lawsuit against Fox and paved the way for competing products from several companies. Customers have won, because they can freely choose other products compatible with the open dBASE® standard.

## Quattro Pro: the best DOS spreadsheet

Quattro Pro has won 42 awards, dwarfing Lotus in side-by-side comparisons. And Quattro Pro 4.0 has been called the best DOS spreadsheet by leading computer trade publications. It's proof that competition works.

## You be the judge

For a good lawyer, call Lotus' law firm. For the best DOS spreadsheet, get Quattro Pro.

## See your dealer today or call

Borland at  
 1-800-331-0877,  
 ext. 5725

## Lotus closes standard, loses the war

So Lotus may have won a small battle by keeping a menu system to themselves, but they'll lose a very big war with their Berlin Wall customer strategy. Borland, on the other hand, has always believed that open standards promote competition, spur innovation, and grow markets.

**B O R L A N D**  
 Software Craftsmanship

DEFENDANT'S EXHIBIT 505

**THERE'S NOTHING INNOVATIVE ABOUT COPYING.**

On Friday, July 31, 1992, a U.S. District Court ruled that Borland's Quattro® and Quattro Pro® spreadsheets infringe the copyrights of Lotus® 1-2-3®.

In its ruling, the Court concluded that "... the Quattro programs derive from illicit copying," holding that "Lotus has sued" and "Borland is liable."

**Lotus innovated. Borland copied.**

We sued to protect our intellectual property rights. And in winning we've helped preserve an environment in which independent software developers can freely develop innovative new products without fear that their creative work will be stolen. We sued to protect innovation, not to stifle it. Borland's copying is no different than someone plagiarizing *The Grapes of Wrath*, changing the ending, and calling it a new novel. It's really that simple.

But the courtroom is just one of the places where Borland® has lost.

They've lost in the marketplace, where 1-2-3 for DOS continues to dominate. Based on a recent report from the Software Publishers Association,\* Lotus 1-2-3 accounts for seven out of 10 new DOS spreadsheet purchases and over 80% of all DOS spreadsheet revenue.

They've lost in performance categories, despite their claims to the contrary. For example, in a recent National Software Testing Laboratories performance test,\*\* 1-2-3 Release 2.4 beats Quattro Pro 4.0 hands down in areas users care about most. The tests reveal that 1-2-3 Release 2.4 is four times faster than Quattro Pro 4.0 in retrieving a .WK1 file; 18 times faster at moving a block of data; three times faster at product load; one-and-a-half times faster at printing; and 35 times faster scrolling right or left in graphical mode.



They've lost on the innovation front, too. Lotus 1-2-3 was the first DOS spreadsheet to introduce innovative technologies such as true 3D worksheets, the Viewer, WYSIWYG display; DataLens®, and unique one-click SmartIcons. And we're still the only spreadsheet that offers true compatibility across platforms.

Who should you trust?

But perhaps most importantly, Borland lost what matters most to customers: credibility.

For instance, Borland told the Court they needed to copy our menus to achieve macro compatibility with 1-2-3. Now they tell their customers that the 1-2-3 menus aren't critical to compatibility.

So ask yourself: to what extent can you trust a company that values what is expedient over what is legal? And to what extent can you rely on the product it wants you to buy?

Here's our advice: choose the product, and the company, you can trust. Choose Lotus. After all, we're the best in the business at building innovative spreadsheets. Always have been, always will be.

Case closed.

LOTUS (logo)

DEFENDANT'S EXHIBIT 507

Jim Manzi

New York PC Users Group  
October 17, 1990

\* \* \*

[7] First, we think you'll find that Release 3.1 is actually a more graphical spreadsheet than either Excel or Quattro Pro. This, you're probably thinking, is a strong statement, coming from [the company that owns 70 percent of the DOS, character-based spreadsheet market.]\*

\* \* \*

\* Received only for bracketed phrase on p. 7.

DEFENDANT'S EXHIBIT 508

SALES SPEECH

Happy New Year!

Did everyone get a copy of the Lotus Game? It's just like real life. If you can ship and sell enough new products—without being distracted by little things like development disasters—you too can retire young to the paradise of your choice.

You can tell the game was designed in Cambridge; it has too much emphasis on reorgs. We've found that no one actually plays the game—they just read the cards. There were a few cards missing from the final version, though. Vince Kelley didn't want everyone in the company to know what's really going on out here in (Los Angeles, Chicago, New York).

But seriously, you can't hide the kind of success we had in 1987. We shipped our three millionth spreadsheet, less than one year after we shipped our two millionth in October 1986. Worldwide sales are up nearly 30 percent in the first three quarters of 1988. 1-2-3 and Symphony are still the corporate standards around the world. The proof of that is in Japan, where 1-2-3 shot to the top of the charts and stayed there.

The funny thing is that a year ago we predicted that spreadsheet sales would be flat. The product segment seemed to be mature, and we assumed that sales of a product as old as 1-2-3 would start to decline.

Were we ever wrong about that! Our performance shows that either Steve Crummey was sandbagging, or we don't know how to use our own products very well. Amazingly enough, sales haven't even peaked yet. Witness the fact that we had our largest shipment ever of 1-2-3 in our most recent quarter. We also had our best quarter for Symphony sales. We've either got the best products on the market or the best sales force in the industry. Maybe we've got both.

We also got a boost from another of our major accomplishments—our strategic agreement with IBM. It's funny, but before April, Wall Street analysts thought Microsoft had the inside track. The analysts who follow Lotus worried about Microsoft coming to market with Excel. And they worried that someday maybe IBM would get into the spreadsheet market, and then all bets on Lotus would be off.

Well, IBM did get into the spreadsheet market—by selling Lotus products. After April, the playing field was level. The agreement removed not only a potential competitor, but the reason why our stock was discounted. It changed a potential rival into an ally, overnight.

And I do mean overnight. We really caught the analysts by surprise. When Jim Manzi made the announcement at Lotus Week, I saw seven Wall Street analysts leap out of their seats and rush for the phone!

As you know, the IBM agreement gives us some very terrific benefits. It gives us an entree into the IBM market. 1-2-3/M runs on everything from 3090 mainframes to the new 9370 mid-size machine. It extends 1-2-3 to 3270 terminal users. All this is nice, but what's really important is that the agreement strategically reinforces 1-2-3 as the corporate spreadsheet standard. People using 1-2-3 on PCs can now roll their data over to a mainframe that can consolidate spreadsheets from hundreds of departments into one giant spreadsheet. And that is more than any of our competitors can do.

We've had another major success story with graphics. Two years ago, at the beginning of 1986, DRI was an independent company making an extremely popular graphics package called Chartmaster. And GCI was an independent company making Freelance, a graphics package that ran a distant second to Chartmaster. That started to change when Ashton-Tate bought DRI, and Lotus bought GCI.

Common wisdom had it that Ashton-Tate made the better deal. After all, they bought the market leader. But Chart-

master didn't seem to fit into their strategy. Plus, Ashton-Tate moved DRI from Massachusetts to California, and in the process conducted a massive shakeout. When it was over, only a few DRI people were left.

In the meanwhile, over at Lotus, we were convinced that Freelance fit into our strategy. We bought GCI because we believed Freelance was the best product on the market, and because it works with 1-2-3. We worked hard to integrate GCI and its people into our organization.

I think we know now who really made the better deal. The situation of the two products is completely reversed. Freelance Plus has a two-to-one lead and holds 48 percent of the graphics software market. Chartmaster lags well behind with a market share between 20 and 30 percent.

Freelance has given us a healthy infusion of revenues. And its success will continue to build. With the introduction of Graphwriter 2, we expect similar spectacular results.

We also established market leadership in Information Services in 1987. We introduced One Source in the fall of 1986 and shipped in the spring of 1987. One Source quickly made us the leader in CD-ROM services, nailing the numbers side of that market. And with the completion of our acquisition of Datest this past fall, we're going to nail down the text side of the market. With Datest we've gotten an interesting product and a lot of good people, including their sales force.

So we've essentially doubled our position in the market and now offer both numbers and text. That's important, because when some people are doing a search on an annual report they want the numbers, while others want to see the company's statement of operations. Together, One Source and Datest give us a tremendous one-two punch in the delivery of financial information on CD-ROM.

According to 3M, which supplies us—and our competitors—with CD-ROMs, we now own 80 percent of the market. The



breadth of our offerings and our market dominance give us immense leverage, both with our customers and with other suppliers of information. Our experience in creating and delivering weekly updates is just as important. It was no small feat to create our own distribution channel, and this channel will give us leverage down the road.

While we've been making advances all along the line on the product front, we've also been strengthening our ties to corporate customers. We took an asset we built up during 1985 and 1986—you, our direct sales force—and used it to develop relationships with corporate accounts in 1987. We got our largest customers together at the Lotus Forum to brief them on the direction we're taking. We put together account teams to service these customers. We started a Product Council composed of corporate users, briefed them on our product plans, and used their feedback to help develop Release 3 of 1-2-3. We went on a 13-city tour that updated 2,000 customers on what's happening at Lotus. We have a Design Partners program, an Application Partners program, Corporate Councils, and Alpha workshops. All of these relationship building activities puts us two years ahead of our customers.

In 1987 we also continued our geographic expansion. In the United States we expanded our office space in eight cities. On the international fronts we opened new sales offices in Toronto, Sydney, Stockholm and Milan.

Finally, throughout the company, we have significantly increased the depth and breadth of our management talent. We have created a structure that fosters an appropriate balance between centralized and decentralized decision making. And we are creating a risk-taking, policy-making level of middle managers who will help define what a \$500 million or a \$1 billion software company should be and who will help chart the course to get there.

What has all this activity accomplished? It's given us a way to communicate our messages directly to our customers, with

no intermediaries. Unlike our competition, we don't have to rely on the trade press or dealers to convey our messages to end users. Some of our competitors now are trying to develop a direct sales force, but we have a two-year lead. And when you consider the fear, uncertainty, and doubt that surround the purchase of software, that lead gives us a tremendous advantage. You are the ones that are right there to help our customers make the right decision—the Lotus decision.

We did a lot of things right in 1987, but we also learned some tough lessons along the way. We found out that the engineering and scientific market wasn't as cohesive thought it would be. We've decided that we can't doing anything more effectively in this market, and we're getting out.

Selling low-priced products through the dealer channel wasn't as easy as we thought it would be. It's hard to get dealers excited about selling a product when the margin is low. So we made the decision to sell small products by catalog, the way we sell Lotus Select, and they're doing fine.

And getting T-A-C and the Networker to market took longer than we thought it would. The good news for 1988 is that we've finally shipped Networker. The better news is that with Release 3 of 1-2-3, Lotus DBMS, and a number of other things we have up our sleeve, our network strategy should emerge and unfold in 1988.

We'll need to remember the lessons we've learned—from both our successes and our mistakes—to deal successfully with the challenges we face in 1988. We made a lot of promises to our customers about product development that we now have to fulfill. So our first and foremost challenge is to help hundreds of thousands of customers through major upgrades on most of our product lines. It will be a lot of work, but we should handle the transitions a lot more smoothly than we handled the one from 1-2-3 to Release 2 of 1-2-3. If we do this right, we'll go home a lot richer and hap-

pier. If we mess up—well, I hear there's a sales territory open in Death Valley.

Our first test will come with Symphony 2.0, which we will formally announce on Thursday. The next—and crucial—test will come in the second quarter with Release 3 of 1-2-3. And let's not forget the upgrades from Jazz to Modern Jazz, Manuscript 1.0 to 2.0, Metro 1.0 to 1.1 in the first quarter, and other products later in the year.

It looks like we'll remember 1988 as the year of the upgrade.

The second challenge we face this year is to maintain our share of the spreadsheet market against increased competition. PC Excel is hitting us at the high end of the spreadsheet market, while Quattro is hitting us at the low end. And there are others out there waiting in the wings. The challenge will be to maintain our high standards of business ethics—and not get suckered into playing by someone else's rules. We'll continue to emphasize the benefits of our products and product strategy, rather than knock the competition.

We'll be giving you briefings later in January and February to remind you of our competitive advantages. But for now, concentrate on the larger issue. We already own 70 percent of the market share, and we have to take care of it. If at the end of 1988 we still own that 70 percent, we're home free. Any increases in market share are pure gravy. But if we allow ourselves to be distracted by worrying about the 30 percent share we don't have—by trying to chase incremental increases in market share—we could lose some of what we already have.

Frankly, we think that if Excel and Quattro take market share, it will be from the clones. So we won't try to stop them from selling their products—we'll just let them fight over the 30 percent of the market that are not Lotus users. Let's not worry about what's happening on the fringes.

Our third challenge is to establish a leadership position in new market segments and in new product categories. This

includes new platforms for 1-2-3, such as Macs, mainframes, and the Presentation Manager. It includes new markets for Lotus—like the database market—with Lotus DBMS. It also includes entirely new categories—for example Personal Information Management. All of these are important new areas for the future growth of the company.

Finally, our fourth challenge will be to develop an active partnership program with our distribution channel. We need dealers and distributors to support spreadsheet sales aggressively. We need to use the distribution channel more intelligently by developing differentiated marketing programs by type of channel specialty. We need to differentiate Lotus based on our ability to help the channel expand sales and profit opportunities. And we need to offset Microsoft's 1-2-3-targeted profit incentives.

So what's our strategy for attaining our goals and meeting our challenges? If this slide looks surprisingly like the last slide, it's because our strategy in 1988 is to meet our challenges head on. We'll focus on helping our customers get through the upgrade process as painlessly as possible. We intend to maintain our share of the spreadsheet market. We expect to establish leadership positions in new segments and new categories. And we hope to develop an active partnership program with the distribution channel.

To put it even more succinctly, our strategy is to do two things right. The first is to protect the investment our customers have made in our products. We'll do this by providing them with smooth upgrades to new technologies and win the best sales, service, and support possible. The second is to continue to find innovative ways to make PC technology more useful to hundreds of thousands of people. No customer should have to sacrifice the technology it already has to take advantage of new technologies.

Actually,—as all of you know—coming up with the strategy is the easy part. Working out the tactics is the hard part. And

implementing them is the hardest part of all. That's up to you. We count on you—the face that the customer sees most often—to make our strategy a success.

This makes a wonderful segue to our next speaker, who'll talk to you about implementation. But before I conclude, let me convey one final message.

On behalf of top management and all the people in Cambridge, thank you for your outstanding efforts in 1987. As Jim Manzi has often said, you are the most talented and professional sales organization in the industry. And thank you, in advance, for the outstanding efforts we expect you'll continue to make in 1988. It puts food on the plate for all of us.

## EXHIBIT 517

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## J.A. 935

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-- PICKLETTER "Q"      Quit ?=87
)
-- PICKLETTER "F"      Stay ?=86
(

```



```

-- PICKLETTER "F"      Stay ?=86 (/ FileMgrColors;Frame)
-- PICKLETTER "B"      Stay ?=86 (/ FileMgrColors;Banner)
-- PICKLETTER "T"      Stay ?=86 (/ FileMgrColors;Text)
-- PICKLETTER "A"      Stay ?=86 (/ FileMgrColors;ActiveCursor)
-- PICKLETTER "I"      Stay ?=86 (/ FileMgrColors;InactiveCursor)
-- PICKLETTER "M"      Stay ?=86 (/ FileMgrColors;Marked)
-- PICKLETTER "C"      Stay ?=86 (/ FileMgrColors;Cut)
-- PICKLETTER "C"      Stay ?=86 (/ FileMgrColors;Copy)
-- PICKLETTER "Q"      Quit ?=86
)
-- PICKLETTER "P"      Stay ?=85
(
-- PICKLETTER "C"      Stay ?=85 (/ Color;ColorPalette)
-- PICKLETTER "M"      Stay ?=85 (/ Color;BWPalette)
-- PICKLETTER "B"      Stay ?=85 (/ Color;BWCGAPalette)
-- PICKLETTER "Q"      Quit ?=85
)
-- PICKLETTER "Q"      Quit ?=92
)
-- PICKLETTER "M"      Stay ?=65
(
-- PICKLETTER "1"      Stay ?=65 (/ Defaults;Button1)
-- PICKLETTER "2"      Stay ?=65 (/ Defaults;Button2)
-- PICKLETTER "3"      Stay ?=65 (/ Defaults;Button3)
-- PICKLETTER "4"      Stay ?=65 (/ Defaults;Button4)
-- PICKLETTER "5"      Stay ?=65 (/ Defaults;Button5)
-- PICKLETTER "6"      Stay ?=65 (/ Defaults;Button6)
-- PICKLETTER "7"      Stay ?=65 (/ Defaults;Button7)
-- PICKLETTER "Q"      Quit ?=65
)

```

```

-- PICKLETTER "F"      Stay ?=588
(
-- PICKLETTER "A"      Quit ?=80 (/ Startup;File)
-- PICKLETTER "S"      Quit ?=79 (/ Startup;Macro)
-- PICKLETTER "F"      Quit ?=78 (/ Startup;Extension)
-- PICKLETTER "M"      Quit ?=76 (/ Startup;Menus)
-- PICKLETTER "E"      Quit ?=71 (/ MenuBuilder;Run)
)
-- PICKLETTER "G"      Stay ?=64 (/ Defaults;GraphicsQuality)
-- PICKLETTER "Q"      Quit ?=596
)
-- PICKLETTER "Z"      Quit ?=591 (/ Defaults;Zero)
)
-- PICKLETTER "I"      Quit ?=592
(
-- PICKLETTER "C"      Quit ?=592 (/ Column;Insert)
-- PICKLETTER "R"      Quit ?=592 (/ Row;Insert)
)
-- PICKLETTER "D"      Quit ?=592
(
-- PICKLETTER "C"      Quit ?=592 (/ Column;Delete)
-- PICKLETTER "R"      Quit ?=592 (/ Row;Delete)
)
-- PICKLETTER "C"      Quit ?=592
(
-- PICKLETTER "S"      Quit ?=587 (/ Column;Width)
-- PICKLETTER "R"      Quit ?=587 (/ Column;Reset)
-- PICKLETTER "H"      Quit ?=587 (/ Column;Hide)
-- PICKLETTER "D"      Quit ?=587 (/ Column;Display)
)
-- PICKLETTER "E"      Quit ?=592 (/ Basics;Erase)
-- PICKLETTER "T"      Quit ?=592

```

## J.A. 940

```

(
-- PICKLETTER "B"      Quit ?=592 (/ Titles;Both)
-- PICKLETTER "H"      Quit ?=592 (/ Titles;Horizontal)
-- PICKLETTER "V"      Quit ?=592 (/ Titles;Vertical)
-- PICKLETTER "C"      Quit ?=592 (/ Titles;Clear)
)
-- PICKLETTER "W"      Quit ?=592
(
-- PICKLETTER "H"      Quit ?=46 (/ Windows;Horizontal)
-- PICKLETTER "V"      Quit ?=46 (/ Windows;Vertical)
-- PICKLETTER "S"      Quit ?=46 (/ Windows;Synch)
-- PICKLETTER "U"      Quit ?=46 (/ Windows;Unsynch)
-- PICKLETTER "C"      Quit ?=46 (/ Windows;Clear)
-- PICKLETTER "R"      Quit ?=46
(
-- PICKLETTER "D"      Quit ?=46 (/ Windows;RowColDisplay)
-- PICKLETTER "H"      Quit ?=46 (/ Windows;RowColHide)
)
-- PICKLETTER "M"      Quit ?=46 (/ Windows;MapView)
)
-- PICKLETTER "S"      Quit ?=592
(
-- PICKLETTER "N"      Quit ?=0 (/ Basics;ShowMem)
-- PICKLETTER "E"      Quit ?=0 (/ Basics;ShowEMS)
-- PICKLETTER "C"      Quit ?=0 (/ Basics;ShowCoProc)
-- PICKLETTER "R"      Quit ?=0 (/ Defaults;RecalcMode)
-- PICKLETTER "R"      Quit ?=0 (/ Defaults;RecalcOrder)
-- PICKLETTER "T"      Quit ?=0 (/ Defaults;RecalcIteration)
-- PICKLETTER "C"      Quit ?=0 (/ Audit;ShowCirc)
-- PICKLETTER "C"      Quit ?=0 (/ Defaults;Format)
-- PICKLETTER "L"      Quit ?=0 (/ Defaults;Alignment)

```

## J.A. 941

```

--
-- PICKLETTER "C"      Quit ?=0 (/ Defaults;CoWidth)
-- PICKLETTER "S"      Quit ?=0 (/ Defaults;Zero)
-- PICKLETTER "P"      Quit ?=0 (/ Protection;Status)
-- PICKLETTER "M"      Quit ?=0 (/ Macro;Library)
-- PICKLETTER "U"      Quit ?=0 (/ Defaults;Undo)
)
-- PICKLETTER "P"      Quit ?=592 (/ Print;CreatePageBreak)
--
-- Quit ?=0
-- DISPLAY-ONLY
-- PICKLETTER "M"      Quit ?=571 (/ Macro;Menu)
-- PICKLETTER "U"      Quit ?=339 (/ Basics;Undo)
)
-- PICKLETTER "R"      Quit ?=586
(
-- PICKLETTER "F"      Quit ?=319 (/ Block;Format)
-- PICKLETTER "L"      Quit ?=320 (/ Block;Align)
-- PICKLETTER "E"      Quit ?=340 (/ Block;Erase)
-- PICKLETTER "N"      Quit ?=336
(
-- PICKLETTER "C"      Quit ?=334 (/ Name;Create)
-- PICKLETTER "D"      Quit ?=332 (/ Name;Delete)
-- PICKLETTER "L"      Quit ?=333
(
-- PICKLETTER "R"      Quit ?=333 (/ Name;RightCreate)
-- PICKLETTER "D"      Quit ?=333 (/ Name;UnderCreate)
-- PICKLETTER "L"      Quit ?=333 (/ Name;LeftCreate)
-- PICKLETTER "U"      Quit ?=333 (/ Name;AboveCreate)
)
-- PICKLETTER "R"      Quit ?=332 (/ Name;Reset)
-- PICKLETTER "T"      Quit ?=331 (/ Name;Table)
)

```

```

-- PICKLETTER "J"      Quit ?=144 (/ Block;Justify)
-- PICKLETTER "P"      Quit ?=314 (/ Block;Protect)
-- PICKLETTER "U"      Quit ?=314 (/ Block;Unprotect)
-- PICKLETTER "I"      Quit ?=177 (/ Block;Input)
-- PICKLETTER "V"      Quit ?=328 (/ Block;Values)
-- PICKLETTER "T"      Quit ?=327 (/ Block;Transpose)
--                      Quit ?=0
-- DISPLAY-ONLY
-- PICKLETTER "C"      Quit ?=310
(
-- PICKLETTER "S"      Quit ?=309 (/ Block;SetWidth)
-- PICKLETTER "R"      Quit ?=312 (/ Block;ResetWidth)
-- PICKLETTER "A"      Quit ?=308 (/ Block;AdjustWidth)
)
-- PICKLETTER "S"      Quit ?=326
(
-- PICKLETTER "B"      Stay ?=325 (/ Audit;ReplaceRange)
-- PICKLETTER "S"      Stay ?=325 (/ Audit;SearchString)
-- PICKLETTER "R"      Stay ?=325 (/ Audit;ReplaceString)
-- PICKLETTER "O"      Stay ?=0
-- PICKLETTER "L"      Stay ?=324 (/ Audit;SearchLookin)
(
-- PICKLETTER "F"      Quit ?=324 (/ Audit;SearchFormula)
-- PICKLETTER "V"      Quit ?=324 (/ Audit;SearchValue)
-- PICKLETTER "C"      Quit ?=324 (/ Audit;SearchCondition)
)
-- PICKLETTER "D"      Stay ?=324 (/ Audit;SearchDirection)
(
-- PICKLETTER "R"      Quit ?=324 (/ Audit;SearchByRow)
-- PICKLETTER "C"      Quit ?=324 (/ Audit;SearchByCol)
)
-- PICKLETTER "M"      Stay ?=324 (/ Audit;SearchMatch)

```

```

--
(
-- PICKLETTER "P"      Quit ?=324 (/ Audit;SearchForPart)
-- PICKLETTER "W"      Quit ?=324 (/ Audit;SearchForWhole)
)
-- PICKLETTER "C"      Stay ?=323 (/ Audit;SearchCase)
(
-- PICKLETTER "A"      Quit ?=323 (/ Audit;SearchAnyCase)
-- PICKLETTER "E"      Quit ?=323 (/ Audit;SearchExactCase)
)
-- PICKLETTER "O"      Stay ?=0 (/ Audit;SearchReset)
--                      Stay ?=0
-- DISPLAY-ONLY
-- PICKLETTER "N"      Stay ?=323 (/ Audit;Replace)
-- PICKLETTER "P"      Stay ?=323 (/ Audit;SearchPrev)
-- PICKLETTER "Q"      Quit ?=326
)
-- PICKLETTER "A"      Quit ?=320
(
-- PICKLETTER "G"      Quit ?=320 (/ Publish;AlignDefault)
-- PICKLETTER "L"      Quit ?=320 (/ Publish;AlignLeft)
-- PICKLETTER "R"      Quit ?=320 (/ Publish;AlignRight)
-- PICKLETTER "C"      Quit ?=320 (/ Publish;AlignCenter)
)
-- PICKLETTER "D"      Quit ?=176
(
-- PICKLETTER "G"      Quit ?=176 (/ Publish;DataEntryFormula)
-- PICKLETTER "L"      Quit ?=176 (/ Publish;DataEntryLabel)
-- PICKLETTER "D"      Quit ?=176 (/ Publish;DataEntryDate)
)
-- PICKLETTER "O"      Quit ?=585
(
-- PICKLETTER "L"      Quit ?=307 (/ Publish;LineDrawing)
-- PICKLETTER "S"      Quit ?=305

```



```

-
(
- PICKLETTER "N"      Quit ?=305 (/ Publish;ShadingNone)
- PICKLETTER "G"      Quit ?=305 (/ Publish;ShadingGrey)
- PICKLETTER "B"      Quit ?=305 (/ Publish;ShadingBlack)
)
- PICKLETTER "F"      Quit ?=304 (/ Publish;Font)
)
- PICKLETTER "C"      Quit ?=348 (/ Block;Copy)
- PICKLETTER "M"      Quit ?=346 (/ Block;Move)
- PICKLETTER "F"      Quit ?=584
(
- PICKLETTER "R"      Quit ?=386 (/ File;Retrieve)
- PICKLETTER "S"      Quit ?=381 (/ File;Save)
- PICKLETTER "C"      Quit ?=140
(
- PICKLETTER "C"      Quit ?=139
(
- PICKLETTER "E"      Quit ?=139 (/ File;CopyFile)
- PICKLETTER "N"      Quit ?=139 (/ File;CopyRange)
)
- PICKLETTER "A"      Quit ?=138
(
- PICKLETTER "E"      Quit ?=138 (/ File;AddFile)
- PICKLETTER "N"      Quit ?=138 (/ File;AddRange)
)
- PICKLETTER "S"      Quit ?=137
(
- PICKLETTER "E"      Quit ?=137 (/ File;SubtractFile)
- PICKLETTER "N"      Quit ?=137 (/ File;SubtractRange)
)
- PICKLETTER "X"      Quit ?=136

```

```

(
- PICKLETTER "F"      Quit ?=135 (/ File;ExtractFormulas)
- PICKLETTER "V"      Quit ?=134 (/ File;ExtractValues)
)
- PICKLETTER "E"      Quit ?=378 (/ File;Erase)
- PICKLETTER "L"      Quit ?=584 (/ File;List)
- PICKLETTER "T"      Quit ?=143
(
- PICKLETTER "T"      Quit ?=142 (/ File;ImportText)
- PICKLETTER "N"      Quit ?=141 (/ File;ImportNumbers)
- PICKLETTER "C"      Quit ?=141 (/ File;ImportComma)
)
- PICKLETTER "D"      Quit ?=377 (/ File;Directory)
-                               Quit ?=0
- DISPLAY-ONLY
- PICKLETTER "N"      Quit ?=387 (/ View;NewWindow)
- PICKLETTER "O"      Quit ?=26 (/ View;OpenWindow)
- PICKLETTER "W"      Quit ?=22
(
- PICKLETTER "S"      Quit ?=22 (/ System;SaveWorkspace)
- PICKLETTER "R"      Quit ?=22 (/ System;RestoreWorkspace)
)
- PICKLETTER "I"      Quit ?=375
(
- PICKLETTER "R"      Stay ?=374 (/ SQZ;Blanks)
- PICKLETTER "S"      Stay ?=373 (/ SQZ;Values)
- PICKLETTER "V"      Stay ?=372 (/ SQZ;Version)
- PICKLETTER "Q"      Quit ?=375
)
- PICKLETTER "U"      Quit ?=0
(
- PICKLETTER "O"      Quit ?=132 (/ Hotlink;Open)
- PICKLETTER "R"      Quit ?=131 (/ Hotlink;Update)

```

## J.A. 946

```

-
- PICKLETTER "C"      Quit ?=130 (/ Hotlink;Change)
-
- PICKLETTER "D"      Quit ?=129 (/ Hotlink;Delete)
-
)
)
- PICKLETTER "P"      Quit ?=583
-
(
- PICKLETTER "D"      Quit ?=0
- PICKLETTER "P"      Quit ?=582 (/ Print;OutputPrinter)
-
(
- PICKLETTER "R"      Stay ?=582 (/ Print;Block)
- PICKLETTER "L"      Stay ?=582 (/ Print;SkipLine)
- PICKLETTER "P"      Stay ?=582 (/ Print;FormFeed)
- PICKLETTER "O"      Stay ?=582
-
(
- PICKLETTER "H"      Stay ?=581 (/ Print;Header)
- PICKLETTER "F"      Stay ?=581 (/ Print;Footer)
- PICKLETTER "M"      Stay ?=581
-
(
- PICKLETTER "L"      Quit ?=581 (/ Print;LeftMargin)
- PICKLETTER "R"      Quit ?=581 (/ Print;RightMargin)
- PICKLETTER "T"      Quit ?=581 (/ Print;TopMargin)
- PICKLETTER "B"      Quit ?=581 (/ Print;BottomMargin)
-
- Quit ?=0
- DISPLAY-ONLY
- PICKLETTER "D"      Quit ?=581 (/ Print;Dimensions)
-
)
- PICKLETTER "B"      Stay ?=581
-
(
- PICKLETTER "C"      Quit ?=581 (/ Print;LeftBorder)
- PICKLETTER "R"      Quit ?=581 (/ Print;TopBorder)
-
)
- PICKLETTER "S"      Stay ?=581 (/ Print;Setup)

```

## J.A. 947

```

- PICKLETTER "P"      Stay ?=581 (/ Print;PageLength)
- PICKLETTER "O"      Stay ?=580 (/ Print;Others)
-
- Stay ?=0
- DISPLAY-ONLY
- PICKLETTER "D"      Stay ?=581 (/ Print;Rotated)
- PICKLETTER "U"      Stay ?=581 (/ Print;Update)
- PICKLETTER "Q"      Quit ?=581
-
)
- PICKLETTER "C"      Stay ?=582
-
(
- PICKLETTER "A"      Quit ?=582 (/ Print;ResetAll)
- PICKLETTER "R"      Quit ?=582 (/ Print;ResetBlock)
- PICKLETTER "B"      Quit ?=582 (/ Print;ResetBorders)
- PICKLETTER "F"      Quit ?=582 (/ Print;ResetDefaults)
-
)
- PICKLETTER "A"      Stay ?=582 (/ Print;Align)
- PICKLETTER "G"      Stay ?=582 (/ Print;Go)
- PICKLETTER "Q"      Quit ?=582
-
)
- PICKLETTER "F"      Quit ?=582 (/ Print;OutputFile)
-
(
- PICKLETTER "R"      Stay ?=582 (/ Print;Block)
- PICKLETTER "L"      Stay ?=582 (/ Print;SkipLine)
- PICKLETTER "P"      Stay ?=582 (/ Print;FormFeed)
- PICKLETTER "O"      Stay ?=582
-
(
- PICKLETTER "H"      Stay ?=581 (/ Print;Header)
- PICKLETTER "F"      Stay ?=581 (/ Print;Footer)
- PICKLETTER "M"      Stay ?=581
-
(
- PICKLETTER "L"      Quit ?=581 (/ Print;LeftMargin)
- PICKLETTER "R"      Quit ?=581 (/ Print;RightMargin)

```

## J.A. 948

```

- PICKLETTER "T"      Quit ?=581 (/ Print;TopMargin)
- PICKLETTER "B"      Quit ?=581 (/ Print;BottomMargin)
-                               Quit ?=0
  DISPLAY-ONLY
- PICKLETTER "D"      Quit ?=581 (/ Print;Dimensions)
)
- PICKLETTER "B"      Stay ?=581
(
- PICKLETTER "C"      Quit ?=581 (/ Print;LeftBorder)
- PICKLETTER "R"      Quit ?=581 (/ Print;TopBorder)
)
- PICKLETTER "S"      Stay ?=581 (/ Print;Setup)
- PICKLETTER "P"      Stay ?=581 (/ Print;PageLength)
- PICKLETTER "O"      Stay ?=580 (/ Print;Others)
-                               Stay ?=0
  DISPLAY-ONLY
- PICKLETTER "D"      Stay ?=581 (/ Print;Rotated)
- PICKLETTER "U"      Stay ?=581 (/ Print;Update)
- PICKLETTER "Q"      Quit ?=581
)
- PICKLETTER "C"      Stay ?=582
(
- PICKLETTER "A"      Quit ?=582 (/ Print;ResetAll)
- PICKLETTER "R"      Quit ?=582 (/ Print;ResetBlock)
- PICKLETTER "B"      Quit ?=582 (/ Print;ResetBorders)
- PICKLETTER "F"      Quit ?=582 (/ Print;ResetDefaults)
)
- PICKLETTER "A"      Stay ?=582 (/ Print;Align)
- PICKLETTER "G"      Stay ?=582 (/ Print;Go)
- PICKLETTER "Q"      Quit ?=582
)
- PICKLETTER "F"      Quit ?=0

```

## J.A. 949

```

- PICKLETTER "B"      Quit ?=582 (/ Print;OutputHOFfile)
(
- PICKLETTER "R"      Stay ?=582 (/ Print;Block)
- PICKLETTER "L"      Stay ?=582 (/ Print;SkipLine)
- PICKLETTER "P"      Stay ?=582 (/ Print;FormFeed)
- PICKLETTER "O"      Stay ?=582
(
- PICKLETTER "H"      Stay ?=581 (/ Print;Header)
- PICKLETTER "F"      Stay ?=581 (/ Print;Footer)
- PICKLETTER "M"      Stay ?=581
(
- PICKLETTER "L"      Quit ?=581 (/ Print;LeftMargin)
- PICKLETTER "R"      Quit ?=581 (/ Print;RightMargin)
- PICKLETTER "T"      Quit ?=581 (/ Print;TopMargin)
- PICKLETTER "B"      Quit ?=581 (/ Print;BottomMargin)
-                               Quit ?=0
  DISPLAY-ONLY
- PICKLETTER "D"      Quit ?=581 (/ Print;Dimensions)
)
- PICKLETTER "B"      Stay ?=581
(
- PICKLETTER "C"      Quit ?=581 (/ Print;LeftBorder)
- PICKLETTER "R"      Quit ?=581 (/ Print;TopBorder)
)
- PICKLETTER "S"      Stay ?=581 (/ Print;Setup)
- PICKLETTER "P"      Stay ?=581 (/ Print;PageLength)
- PICKLETTER "O"      Stay ?=580 (/ Print;Others)
-                               Stay ?=0
  DISPLAY-ONLY
- PICKLETTER "D"      Stay ?=581 (/ Print;Rotated)
- PICKLETTER "U"      Stay ?=581 (/ Print;Update)
- PICKLETTER "Q"      Quit ?=581

```



## J.A. 950

```

)
-- PICKLETTER "C"      Stay ?=582
(
-- PICKLETTER "A"      Quit ?=582 (/ Print;ResetAll)
-- PICKLETTER "R"      Quit ?=582 (/ Print;ResetBlock)
-- PICKLETTER "B"      Quit ?=582 (/ Print;ResetBorders)
-- PICKLETTER "F"      Quit ?=582 (/ Print;ResetDefaults)
)
-- PICKLETTER "A"      Stay ?=582 (/ Print;Align)
-- PICKLETTER "G"      Stay ?=582 (/ Print;Go)
-- PICKLETTER "Q"      Quit ?=582
)
-- PICKLETTER "G"      Quit ?=582 (/ Print;OutputHQ)
(
-- PICKLETTER "R"      Stay ?=582 (/ Print;Block)
-- PICKLETTER "L"      Stay ?=582 (/ Print;SkipLine)
-- PICKLETTER "P"      Stay ?=582 (/ Print;FormFeed)
-- PICKLETTER "O"      Stay ?=582
)
-- PICKLETTER "H"      Stay ?=581 (/ Print;Header)
-- PICKLETTER "F"      Stay ?=581 (/ Print;Footer)
-- PICKLETTER "M"      Stay ?=581
(
-- PICKLETTER "L"      Quit ?=581 (/ Print;LeftMargin)
-- PICKLETTER "R"      Quit ?=581 (/ Print;RightMargin)
-- PICKLETTER "T"      Quit ?=581 (/ Print;TopMargin)
-- PICKLETTER "B"      Quit ?=581 (/ Print;BottomMargin)
--
-- DISPLAY-ONLY      Quit ?=0
-- PICKLETTER "D"      Quit ?=581 (/ Print;Dimensions)
)
-- PICKLETTER "B"      Stay ?=581

```

## J.A. 951

```

(
-- PICKLETTER "C"      Quit ?=581 (/ Print;LeftBorder)
-- PICKLETTER "R"      Quit ?=581 (/ Print;TopBorder)
)
-- PICKLETTER "S"      Stay ?=581 (/ Print;Setup)
-- PICKLETTER "P"      Stay ?=581 (/ Print;PageLength)
-- PICKLETTER "O"      Stay ?=580 (/ Print;Others)
--
-- Stay ?=0
-- DISPLAY-ONLY
-- PICKLETTER "D"      Stay ?=581 (/ Print;Rotated)
-- PICKLETTER "U"      Stay ?=581 (/ Print;Update)
-- PICKLETTER "Q"      Quit ?=581
)
-- PICKLETTER "C"      Stay ?=582
(
-- PICKLETTER "A"      Quit ?=582 (/ Print;ResetAll)
-- PICKLETTER "R"      Quit ?=582 (/ Print;ResetBlock)
-- PICKLETTER "B"      Quit ?=582 (/ Print;ResetBorders)
-- PICKLETTER "F"      Quit ?=582 (/ Print;ResetDefaults)
)
-- PICKLETTER "A"      Stay ?=582 (/ Print;Align)
-- PICKLETTER "G"      Stay ?=582 (/ Print;Go)
-- PICKLETTER "Q"      Quit ?=582
)
-- PICKLETTER "S"      Quit ?=582 (/ Print;OutputPreview)
(
-- PICKLETTER "R"      Stay ?=582 (/ Print;Block)
-- PICKLETTER "L"      Stay ?=582 (/ Print;SkipLine)
-- PICKLETTER "P"      Stay ?=582 (/ Print;FormFeed)
-- PICKLETTER "O"      Stay ?=582
)
-- PICKLETTER "H"      Stay ?=581 (/ Print;Header)

```

```

- PICKLETTER "F"      Stay ?=581 (/ Print;Footer)
- PICKLETTER "M"      Stay ?=581
(
- PICKLETTER "L"      Quit ?=581 (/ Print;LeftMargin)
- PICKLETTER "R"      Quit ?=581 (/ Print;RightMargin)
- PICKLETTER "T"      Quit ?=581 (/ Print;TopMargin)
- PICKLETTER "B"      Quit ?=581 (/ Print;BottomMargin)
-                               Quit ?=0
  DISPLAY-ONLY
- PICKLETTER "D"      Quit ?=581 (/ Print;Dimensions)
)
- PICKLETTER "B"      Stay ?=581
(
- PICKLETTER "C"      Quit ?=581 (/ Print;LeftBorder)
- PICKLETTER "R"      Quit ?=581 (/ Print;TopBorder)
)
- PICKLETTER "S"      Stay ?=581 (/ Print;Setup)
- PICKLETTER "P"      Stay ?=581 (/ Print;PageLength)
- PICKLETTER "O"      Stay ?=580 (/ Print;Others)
-                               Stay ?=0
  DISPLAY-ONLY
- PICKLETTER "D"      Stay ?=581 (/ Print;Rotated)
- PICKLETTER "U"      Stay ?=581 (/ Print;Update)
- PICKLETTER "Q"      Quit ?=581
)
- PICKLETTER "C"      Stay ?=582
(
- PICKLETTER "A"      Quit ?=582 (/ Print;ResetAll)
- PICKLETTER "R"      Quit ?=582 (/ Print;ResetBlock)
- PICKLETTER "B"      Quit ?=582 (/ Print;ResetBorders)
- PICKLETTER "F"      Quit ?=582 (/ Print;ResetDefaults)
)
- PICKLETTER "A"      Stay ?=582 (/ Print;Align)

```

```

-                               Stay ?=582 (/ Print;Go)
- PICKLETTER "Q"      Quit ?=582
)
- PICKLETTER "C"      Quit ?=200
(
- PICKLETTER "D"      Stay ?=221 (/ GraphPrint;Destination)
(
- PICKLETTER "F"      Quit ?=220 (/ GraphPrint;DestIsFile)
- PICKLETTER "G"      Quit ?=221 (/ GraphPrint;DestIsPtr)
- PICKLETTER "S"      Quit ?=218 (/ GraphPrint;DestIsPreview)
)
- PICKLETTER "L"      Stay ?=199
(
- PICKLETTER "L"      Stay ?=199 (/ GraphPrint;Left)
- PICKLETTER "T"      Stay ?=199 (/ GraphPrint;Top)
- PICKLETTER "H"      Stay ?=199 (/ GraphPrint;Height)
- PICKLETTER "W"      Stay ?=199 (/ GraphPrint;Width)
-                               Stay ?=0
  DISPLAY-ONLY
- PICKLETTER "D"      Stay ?=208 (/ GraphPrint;Dimensions)
- PICKLETTER "O"      Stay ?=207 (/ GraphPrint;Rotated)
- PICKLETTER "4"      Stay ?=209 (/ Hardware;Aspect43)
-                               Stay ?=0
  DISPLAY-ONLY
- PICKLETTER "R"      Stay ?=199 (/ Print;ResetAll)
- PICKLETTER "U"      Stay ?=204 (/ Print;Update)
- PICKLETTER "Q"      Quit ?=199
)
- PICKLETTER "G"      Stay ?=201 (/ GraphPrint;Go)
- PICKLETTER "W"      Stay ?=197
(
- PICKLETTER "E"      Stay ?=197 (/ GraphFile;Postscript)

```

## J.A. 954

```

-- PICKLETTER "P"      Stay ?=197 (/ GraphFile;PIC)
-- PICKLETTER "S"      Stay ?=197 (/ GraphFile;SlideEPS)
-- PICKLETTER "X"      Stay ?=197 (/ GraphFile;PCX)
-- PICKLETTER "Q"      Quit ?=197
)
-- PICKLETTER "N"      Stay ?=196 (/ GraphPrint;Use)
-- PICKLETTER "Q"      Quit ?=199
)
-- PICKLETTER "G"      Quit ?=578
(
-- PICKLETTER "T"      Stay ?=297 (/ Graph;Type)
-- PICKLETTER "X"      Stay ?=578 (/ XAxis;Labels)
-- PICKLETTER "A"      Stay ?=578 (/ 1Series;Block)
-- PICKLETTER "B"      Stay ?=578 (/ 2Series;Block)
-- PICKLETTER "C"      Stay ?=578 (/ 3Series;Block)
-- PICKLETTER "D"      Stay ?=578 (/ 4Series;Block)
-- PICKLETTER "E"      Stay ?=578 (/ 5Series;Block)
-- PICKLETTER "F"      Stay ?=578 (/ 6Series;Block)
-- PICKLETTER "R"      Stay ?=578
(
-- PICKLETTER "G"      GoUp ?=578 (/ Graph;ResetAll)
-- PICKLETTER "X"      Stay ?=578 (/ XAxis;Reset)
-- PICKLETTER "A"      Stay ?=578 (/ Graph;Reset1)
-- PICKLETTER "B"      Stay ?=578 (/ Graph;Reset2)
-- PICKLETTER "C"      Stay ?=578 (/ Graph;Reset3)
-- PICKLETTER "D"      Stay ?=578 (/ Graph;Reset4)
-- PICKLETTER "E"      Stay ?=578 (/ Graph;Reset5)
-- PICKLETTER "F"      Stay ?=578 (/ Graph;Reset6)
-- PICKLETTER "Q"      Quit ?=578

```

## J.A. 955

```

-- PICKLETTER "V"      Stay ?=246 (/ Graph;View)
-- PICKLETTER "S"      Stay ?=578 (/ GraphFile;PIC)
-- PICKLETTER "O"      Stay ?=577
(
-- PICKLETTER "L"      Stay ?=286
(
-- PICKLETTER "A"      Quit ?=286 (/ 1Series;Legend)
-- PICKLETTER "B"      Quit ?=286 (/ 2Series;Legend)
-- PICKLETTER "C"      Quit ?=286 (/ 3Series;Legend)
-- PICKLETTER "D"      Quit ?=286 (/ 4Series;Legend)
-- PICKLETTER "E"      Quit ?=286 (/ 5Series;Legend)
-- PICKLETTER "F"      Quit ?=286 (/ 6Series;Legend)
--                               Quit ?=0
-- DISPLAY-ONLY
-- PICKLETTER "P"      Quit ?=577 (/ Graph;LegendPos)
-- PICKLETTER "T"      Quit ?=577 (/ GraphPrint;Fonts)
)
-- PICKLETTER "F"      Stay ?=278
(
-- PICKLETTER "G"      Stay ?=278 (/ CompGraph;GraphFormat)
-- PICKLETTER "A"      Stay ?=278 (/ CompGraph;AFormat)
-- PICKLETTER "B"      Stay ?=278 (/ CompGraph;BFormat)
-- PICKLETTER "C"      Stay ?=278 (/ CompGraph;CFormat)
-- PICKLETTER "D"      Stay ?=278 (/ CompGraph;DFormat)
-- PICKLETTER "E"      Stay ?=278 (/ CompGraph;EFormat)
-- PICKLETTER "F"      Stay ?=278 (/ CompGraph;FFormat)
--                               Stay ?=0
-- DISPLAY-ONLY
-- PICKLETTER "L"      Stay ?=280
(
-- PICKLETTER "A"      Stay ?=280 (/ 1Series;LineStyle)

```



## J.A. 956

```

- PICKLETTER "B"      Stay ?=280 (/ 2Series;LineStyle)
- PICKLETTER "C"      Stay ?=280 (/ 3Series;LineStyle)
- PICKLETTER "D"      Stay ?=280 (/ 4Series;LineStyle)
- PICKLETTER "E"      Stay ?=280 (/ 5Series;LineStyle)
- PICKLETTER "F"      Stay ?=280 (/ 6Series;LineStyle)
- PICKLETTER "Q"      Quit ?=280
)
- PICKLETTER "M"      Stay ?=279
(
- PICKLETTER "A"      Stay ?=279 (/ 1Series;Markers)
- PICKLETTER "B"      Stay ?=279 (/ 2Series;Markers)
- PICKLETTER "C"      Stay ?=279 (/ 3Series;Markers)
- PICKLETTER "D"      Stay ?=279 (/ 4Series;Markers)
- PICKLETTER "E"      Stay ?=279 (/ 5Series;Markers)
- PICKLETTER "F"      Stay ?=279 (/ 6Series;Markers)
- PICKLETTER "Q"      Quit ?=279
)
- PICKLETTER "Q"      Quit ?=0
)
- PICKLETTER "T"      Stay ?=287
(
- PICKLETTER "F"      Quit ?=287 (/ Graph;MainTitle)
- PICKLETTER "S"      Quit ?=287 (/ Graph;SubTitle)
- PICKLETTER "X"      Quit ?=287 (/ XAxis;Title)
- PICKLETTER "Y"      Quit ?=287 (/ YAxis;Title)
-                               Quit ?=0
  DISPLAY-ONLY
- PICKLETTER "Z"      Quit ?=287 (/ Y2Axis;Title)
- PICKLETTER "T"      Quit ?=285 (/ GraphPrint;Fonts)
)
- PICKLETTER "G"      Stay ?=255 (/ Graph;GridStatus)

```

## J.A. 957

```

-
(
- PICKLETTER "H"      Quit ?=255 (/ CompGraph;GridHorz)
- PICKLETTER "V"      Quit ?=255 (/ CompGraph;GridVert)
- PICKLETTER "B"      Quit ?=255 (/ CompGraph;GridBoth)
- PICKLETTER "C"      Quit ?=255 (/ CompGraph;GridClear)
-                               Quit ?=0
  DISPLAY-ONLY
- PICKLETTER "G"      Quit ?=255 (/ Graph;GridColor)
- PICKLETTER "L"      Quit ?=255 (/ Graph;GridLines)
- PICKLETTER "F"      Quit ?=255 (/ Graph;GridFill)
)
- PICKLETTER "S"      Stay ?=576
(
- PICKLETTER "Y"      Quit ?=258
(
- PICKLETTER "A"      Stay ?=264 (/ CompGraph;YAuto)
- PICKLETTER "M"      Stay ?=264 (/ CompGraph;YManual)
- PICKLETTER "L"      Stay ?=264 (/ YAxis;Min)
- PICKLETTER "U"      Stay ?=264 (/ YAxis;Max)
- PICKLETTER "F"      Stay ?=263 (/ YAxis;Format)
- PICKLETTER "T"      Stay ?=260 (/ YAxis;ShowScale)
-                               Stay ?=0
  DISPLAY-ONLY
- PICKLETTER "T"      Stay ?=264 (/ YAxis;Step)
- PICKLETTER "N"      Stay ?=262 (/ YAxis;Skip)
- PICKLETTER "S"      Stay ?=259 (/ YAxis;ScaleType)
- PICKLETTER "Q"      Quit ?=264
)
- PICKLETTER "X"      Quit ?=265
(
- PICKLETTER "A"      Stay ?=264 (/ CompGraph;XAuto)
- PICKLETTER "M"      Stay ?=264 (/ CompGraph;XManual)

```

```

-
- PICKLETTER "L"      Stay ?=264 (/ XAxis;Min)
- PICKLETTER "U"      Stay ?=264 (/ XAxis;Max)
- PICKLETTER "F"      Stay ?=263 (/ XAxis;Format)
- PICKLETTER "I"      Stay ?=260 (/ XAxis;ShowScale)
-
- Stay ?=0
- DISPLAY-ONLY
- PICKLETTER "T"      Stay ?=264 (/ XAxis;Step)
- PICKLETTER "S"      Stay ?=259 (/ XAxis;ScaleType)
- PICKLETTER "D"      Stay ?=261 (/ XAxis;Alternate)
- PICKLETTER "Q"      Quit ?=264
)
- PICKLETTER "S"      Quit ?=262 (/ XAxis;Skip)
-
- Quit ?=0
- DISPLAY-ONLY
- PICKLETTER "Z"      Quit ?=257
(
- PICKLETTER "A"      Stay ?=264 (/ CompGraph;Y2Auto)
- PICKLETTER "M"      Stay ?=264 (/ CompGraph;Y2Manual)
- PICKLETTER "L"      Stay ?=264 (/ Y2Axis;Min)
- PICKLETTER "U"      Stay ?=264 (/ Y2Axis;Max)
- PICKLETTER "F"      Stay ?=263 (/ Y2Axis;Format)
- PICKLETTER "I"      Stay ?=260 (/ Y2Axis;ShowScale)
-
- Stay ?=0
- DISPLAY-ONLY
- PICKLETTER "T"      Stay ?=264 (/ Y2Axis;Step)
- PICKLETTER "N"      Stay ?=262 (/ Y2Axis;Skip)
- PICKLETTER "S"      Stay ?=259 (/ Y2Axis;ScaleType)
- PICKLETTER "Q"      Quit ?=264
)
)
- PICKLETTER "C"      Stay ?=577 (/ Graph;Color)
- PICKLETTER "B"      Stay ?=577 (/ Graph;BW)

```

```

-
- PICKLETTER "D"      Stay ?=577
(
- PICKLETTER "A"      Stay ?=276 (/ CompGraph;ALabels)
- PICKLETTER "B"      Stay ?=276 (/ CompGraph;BLabels)
- PICKLETTER "C"      Stay ?=276 (/ CompGraph;CLabels)
- PICKLETTER "D"      Stay ?=276 (/ CompGraph;DLabels)
- PICKLETTER "E"      Stay ?=276 (/ CompGraph;ELabels)
- PICKLETTER "F"      Stay ?=276 (/ CompGraph;FLabels)
-
- Stay ?=0
- DISPLAY-ONLY
- PICKLETTER "T"      Stay ?=285 (/ GraphPrint;Fonts)
- PICKLETTER "Q"      Quit ?=577
)
-
- Stay ?=0
- DISPLAY-ONLY
- PICKLETTER "R"      Stay ?=284
(
- PICKLETTER "C"      Stay ?=283
(
- PICKLETTER "A"      Stay ?=283 (/ 1Series;Color)
- PICKLETTER "B"      Stay ?=283 (/ 2Series;Color)
- PICKLETTER "C"      Stay ?=283 (/ 3Series;Color)
- PICKLETTER "D"      Stay ?=283 (/ 4Series;Color)
- PICKLETTER "E"      Stay ?=283 (/ 5Series;Color)
- PICKLETTER "F"      Stay ?=283 (/ 6Series;Color)
- PICKLETTER "Q"      Quit ?=284
)
- PICKLETTER "F"      Stay ?=282
(
- PICKLETTER "A"      Stay ?=282 (/ 1Series;Pattern)
- PICKLETTER "B"      Stay ?=282 (/ 2Series;Pattern)
- PICKLETTER "C"      Stay ?=282 (/ 3Series;Pattern)

```

## J.A. 960

```

-
- PICKLETTER "D"      Stay ?=282 (/ 4Series;Pattern)
-
- PICKLETTER "E"      Stay ?=282 (/ 5Series;Pattern)
-
- PICKLETTER "F"      Stay ?=282 (/ 6Series;Pattern)
-
- PICKLETTER "Q"      Quit ?=284
-
)
- PICKLETTER "O"      Stay ?=278
-
(
- PICKLETTER "A"      Stay ?=278 (/ 1Series;Type)
-
- PICKLETTER "B"      Stay ?=278 (/ 2Series;Type)
-
- PICKLETTER "C"      Stay ?=278 (/ 3Series;Type)
-
- PICKLETTER "D"      Stay ?=278 (/ 4Series;Type)
-
- PICKLETTER "E"      Stay ?=278 (/ 5Series;Type)
-
- PICKLETTER "F"      Stay ?=278 (/ 6Series;Type)
-
- PICKLETTER "Q"      Quit ?=284
-
)
- PICKLETTER "Y"      Stay ?=284
-
(
- PICKLETTER "A"      Stay ?=274 (/ 1Series;YAxis)
-
- PICKLETTER "B"      Stay ?=274 (/ 2Series;YAxis)
-
- PICKLETTER "C"      Stay ?=274 (/ 3Series;YAxis)
-
- PICKLETTER "D"      Stay ?=274 (/ 4Series;YAxis)
-
- PICKLETTER "E"      Stay ?=274 (/ 5Series;YAxis)
-
- PICKLETTER "F"      Stay ?=274 (/ 6Series;YAxis)
-
- PICKLETTER "Q"      Quit ?=284
-
)
- PICKLETTER "P"      Stay ?=273
-
(
- PICKLETTER "L"      Quit ?=272 (/ Pie;ValueFormat)
-
- PICKLETTER "E"      Quit ?=271
-
(

```

## J.A. 961

```

- PICKLETTER "I"      Stay ?=271 (/ PieExploded;1)
-
- PICKLETTER "2"      Stay ?=271 (/ PieExploded;2)
-
- PICKLETTER "3"      Stay ?=271 (/ PieExploded;3)
-
- PICKLETTER "4"      Stay ?=271 (/ PieExploded;4)
-
- PICKLETTER "5"      Stay ?=271 (/ PieExploded;5)
-
- PICKLETTER "6"      Stay ?=271 (/ PieExploded;6)
-
- PICKLETTER "7"      Stay ?=271 (/ PieExploded;7)
-
- PICKLETTER "8"      Stay ?=271 (/ PieExploded;8)
-
- PICKLETTER "9"      Stay ?=271 (/ PieExploded;9)
-
- PICKLETTER "Q"      Quit ?=273
-
)
- PICKLETTER "P"      Quit ?=270
-
(
- PICKLETTER "1"      Stay ?=270 (/ PiePattern;1)
-
- PICKLETTER "2"      Stay ?=270 (/ PiePattern;2)
-
- PICKLETTER "3"      Stay ?=270 (/ PiePattern;3)
-
- PICKLETTER "4"      Stay ?=270 (/ PiePattern;4)
-
- PICKLETTER "5"      Stay ?=270 (/ PiePattern;5)
-
- PICKLETTER "6"      Stay ?=270 (/ PiePattern;6)
-
- PICKLETTER "7"      Stay ?=270 (/ PiePattern;7)
-
- PICKLETTER "8"      Stay ?=270 (/ PiePattern;8)
-
- PICKLETTER "9"      Stay ?=270 (/ PiePattern;9)
-
- PICKLETTER "Q"      Quit ?=273
-
)
- PICKLETTER "C"      Quit ?=269
-
(
- PICKLETTER "1"      Stay ?=269 (/ PieColor;1)
-
- PICKLETTER "2"      Stay ?=269 (/ PieColor;2)
-
- PICKLETTER "3"      Stay ?=269 (/ PieColor;3)

```



```

- PICKLETTER "4"      Stay ?=269 (/ PieColor;4)
- PICKLETTER "5"      Stay ?=269 (/ PieColor;5)
- PICKLETTER "6"      Stay ?=269 (/ PieColor;6)
- PICKLETTER "7"      Stay ?=269 (/ PieColor;7)
- PICKLETTER "8"      Stay ?=269 (/ PieColor;8)
- PICKLETTER "9"      Stay ?=269 (/ PieColor;9)
- PICKLETTER "Q"      Quit ?=273
)
- PICKLETTER "T"      Quit ?=268 (/ Pie;TickMarks)
)
- PICKLETTER "B"      Stay ?=277 (/ Graph;BarWidth)
- PICKLETTER "Q"      Quit ?=284
)
- PICKLETTER "O"      Stay ?=256
(
- PICKLETTER "O"      Quit ?=254
(
- PICKLETTER "T"      Quit ?=254 (/ Graph;TitleOff)
- PICKLETTER "L"      Quit ?=254 (/ Graph;LegendOff)
- PICKLETTER "G"      Quit ?=254 (/ Graph;GraphOff)
)
- PICKLETTER "B"      Quit ?=253 (/ Graph;BackColor)
- PICKLETTER "T"      Quit ?=252 (/ Graph;3D)
)
- PICKLETTER "A"      Stay ?=244 (/ Graph;Annotate)
- PICKLETTER "T"      Stay ?=251 (/ Graph;NameInsert)
- PICKLETTER "H"      Stay ?=250 (/ Graph;NameHide)
- PICKLETTER "U"      Stay ?=267 (/ Graph;UpdateGraph)
- PICKLETTER "Q"      Quit ?=284
)
- PICKLETTER "N"      Stay ?=249

```

```

(
- PICKLETTER "U"      Quit ?=249 (/ Graph;NameUse)
- PICKLETTER "C"      Quit ?=249 (/ Graph;NameCreate)
- PICKLETTER "D"      Quit ?=249 (/ Graph;NameDelete)
- PICKLETTER "S"      Quit ?=249 (/ Graph;NameSlide)
- PICKLETTER "R"      Quit ?=249 (/ Graph;NameReset)
- PICKLETTER "G"      Quit ?=249 (/ Graph;NameCopy)
)
- Stay ?=0
- DISPLAY-ONLY
- PICKLETTER "T"      Stay ?=245 (/ Graph;FastGraph)
- PICKLETTER "Q"      Quit ?=284
)
- PICKLETTER "D"      Quit ?=575
(
- PICKLETTER "F"      Quit ?=575 (/ Math;Fill)
- PICKLETTER "T"      Quit ?=575
(
- PICKLETTER "1"      Quit ?=109 (/ Math;1CellWhat-If)
- PICKLETTER "2"      Quit ?=108 (/ Math;2CellWhat-If)
- PICKLETTER "R"      Quit ?=110 (/ Math;ResetWhat-If)
)
- PICKLETTER "S"      Quit ?=575
(
- PICKLETTER "D"      Stay ?=194 (/ Sort;Block)
- PICKLETTER "P"      Stay ?=194 (/ Sort;Key1)
- PICKLETTER "S"      Stay ?=194 (/ Sort;Key2)
- PICKLETTER "3"      Stay ?=194 (/ Sort;Key3)
- PICKLETTER "4"      Stay ?=194 (/ Sort;Key4)
- PICKLETTER "5"      Stay ?=194 (/ Sort;Key5)
- PICKLETTER "R"      Stay ?=194 (/ Sort;Reset)
- PICKLETTER "G"      Stay ?=194 (/ Sort;Go)

```

```

-
- Stay ?=0
- DISPLAY-ONLY
- PICKLETTER "O" Stay ?=194
(
- PICKLETTER "N" Stay ?=191 (/ Startup;CellOrder)
- PICKLETTER "L" Stay ?=191 (/ Startup;LabelOrder)
- PICKLETTER "Q" Quit ?=194
)
- PICKLETTER "Q" Quit ?=194
)
- PICKLETTER "Q" Quit ?=575
(
- PICKLETTER "T" Stay ?=188 (/ Query;Block)
- PICKLETTER "C" Stay ?=186 (/ Query;CriteriaBlock)
- PICKLETTER "O" Stay ?=183 (/ Query;Output)
- PICKLETTER "A" Stay ?=182 (/ Query;AssignNames)
- PICKLETTER "F" Stay ?=181 (/ Query;Locate)
- PICKLETTER "E" Stay ?=180 (/ Query;Extract)
- PICKLETTER "U" Stay ?=180 (/ Query;Unique)
- PICKLETTER "D" Stay ?=179 (/ Query;Delete)
- PICKLETTER "R" Stay ?=178 (/ Query;Reset)
- PICKLETTER "Q" Quit ?=190
)
- PICKLETTER "D" Quit ?=575 (/ Math;Distribution)
- PICKLETTER "M" Quit ?=575
(
- PICKLETTER "T" Quit ?=123 (/ Math;InvertMatrix)
- PICKLETTER "M" Quit ?=122 (/ Math;MultiplyMatrix)
)
- PICKLETTER "R" Quit ?=575
(
- PICKLETTER "X" Stay ?=126 (/ Regression;Independent)

```

```

-
- PICKLETTER "Y" Stay ?=126 (/ Regression;Dependent)
- PICKLETTER "O" Stay ?=126 (/ Regression;Output)
- PICKLETTER "I" Stay ?=125 (/ Regression;Intercept)
- PICKLETTER "R" Stay ?=127 (/ Regression;Reset)
- PICKLETTER "G" Stay ?=127 (/ Regression;Go)
- PICKLETTER "Q" Quit ?=127
)
- PICKLETTER "P" Quit ?=575
(
- PICKLETTER "F" Stay ?=116
(
- PICKLETTER "C" Quit ?=114 (/ Parse;CreateLine)
- PICKLETTER "E" Quit ?=112 (/ Parse;EditLine)
)
- PICKLETTER "I" Stay ?=115 (/ Parse;Input)
- PICKLETTER "O" Stay ?=115 (/ Parse;Output)
- PICKLETTER "R" Stay ?=116 (/ Parse;Reset)
- PICKLETTER "G" Stay ?=111 (/ Parse;Go)
- PICKLETTER "Q" Quit ?=116
)
- Quit ?=0
- DISPLAY-ONLY
- PICKLETTER "O" Quit ?=0
(
- PICKLETTER "L" Stay ?=120 (/ Optimization;Coefficients)
- PICKLETTER "T" Stay ?=120 (/ Optimization;Relations)
- PICKLETTER "C" Stay ?=120 (/ Optimization;Constants)
- PICKLETTER "B" Stay ?=119 (/ Optimization;Bounds)
- PICKLETTER "F" Stay ?=119 (/ Optimization;Formulas)
- PICKLETTER "O" Stay ?=119 (/ Optimization;Objective)
- PICKLETTER "E" Stay ?=119 (/ Optimization;Extremum)

```

```

--
-- Stay ?=0
-- DISPLAY-ONLY
-- PICKLETTER "S" Stay ?=118 (/ Optimization;Solution)
-- PICKLETTER "V" Stay ?=118 (/ Optimization;Variables)
-- PICKLETTER "D" Stay ?=118 (/ Optimization;Dual)
-- PICKLETTER "A" Stay ?=118 (/ Optimization;Additional)
--
-- Stay ?=0
-- DISPLAY-ONLY
-- PICKLETTER "G" Stay ?=117 (/ Optimization;Go)
-- PICKLETTER "R" Stay ?=117 (/ Optimization;Reset)
-- PICKLETTER "Q" Quit ?=117
)
-- PICKLETTER "V" Quit ?=105
(
-- PICKLETTER "F" Stay ?=104 (/ Math;SolveFormula)
-- PICKLETTER "T" Stay ?=104 (/ Math;SolveTarget)
-- PICKLETTER "V" Stay ?=104 (/ Math;SolveVariable)
-- PICKLETTER "P" Stay ?=104
(
-- PICKLETTER "M" Quit ?=104 (/ Math;SolveMaxIt)
-- PICKLETTER "A" Quit ?=104 (/ Math;SolveAccuracy)
)
-- PICKLETTER "G" Stay ?=104 (/ Math;SolveGo)
-- PICKLETTER "R" Stay ?=104 (/ Math;SolveReset)
-- PICKLETTER "Q" Quit ?=104
)
-- PICKLETTER "A" Quit ?=175
(
-- PICKLETTER "G" Stay ?=173 (/ Paradox;SwitchGo)
-- PICKLETTER "L" Stay ?=172 (/ Paradox;SwitchFile)
-- PICKLETTER "A" Stay ?=171 (/ Paradox;SwitchAutoLoad)
-- PICKLETTER "Q" Quit ?=169

```

```

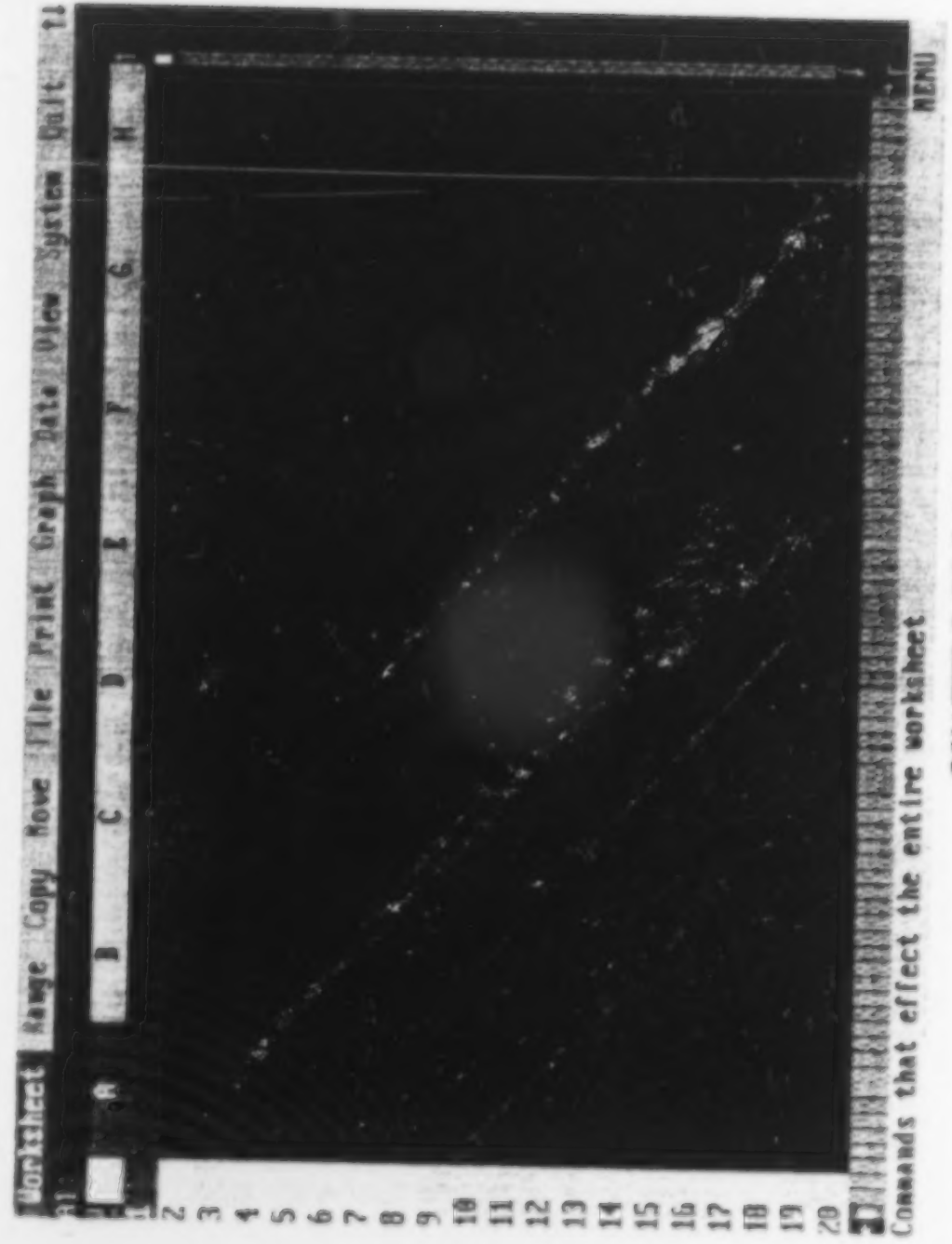
)
-- PICKLETTER "V" Quit ?=574
(
-- PICKLETTER "Z" Quit ?=574 (/ View;Zoom)
-- PICKLETTER "T" Quit ?=574 (/ View;Arrange)
-- PICKLETTER "S" Quit ?=574 (/ View;Cascade)
-- PICKLETTER "M" Quit ?=574 (/ View;Size)
-- PICKLETTER "P" Quit ?=574 (/ View;Choose)
--
-- Quit ?=574
-- DISPLAY-ONLY
-- PICKLETTER "C" Quit ?=574 (/ Basics;Close)
-- PICKLETTER "L" Quit ?=574 (/ System;TidyUp)
-- PICKLETTER "X" Quit ?=574 (/ System;Exit)
)
-- PICKLETTER "S" Quit ?=573
(
-- PICKLETTER "O" Quit ?=573 (/ Basics;OS)
--
-- Quit ?=0
-- DISPLAY-ONLY
-- PICKLETTER "D" Quit ?=83 (/ ScreenHardware;TextScreenMode)
-- PICKLETTER "F" Quit ?=370 (/ View;NewFileMgr)
)
-- PICKLETTER "Q" Quit ?=593 (/ Basics;Quit)
)
)

```



**Exhibits from Brief of Plaintiff/Appellee from  
Court of Appeals for the First Circuit**

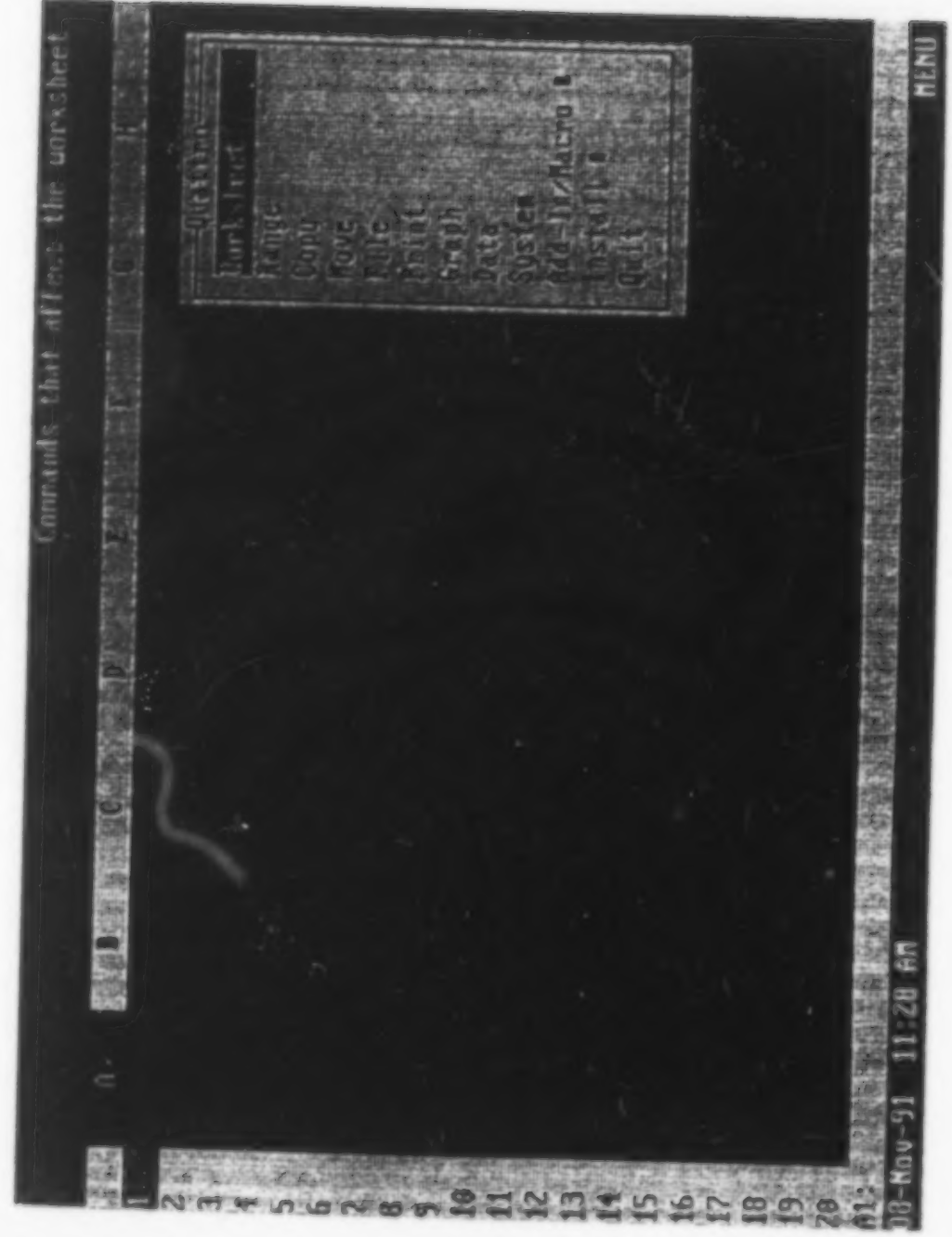




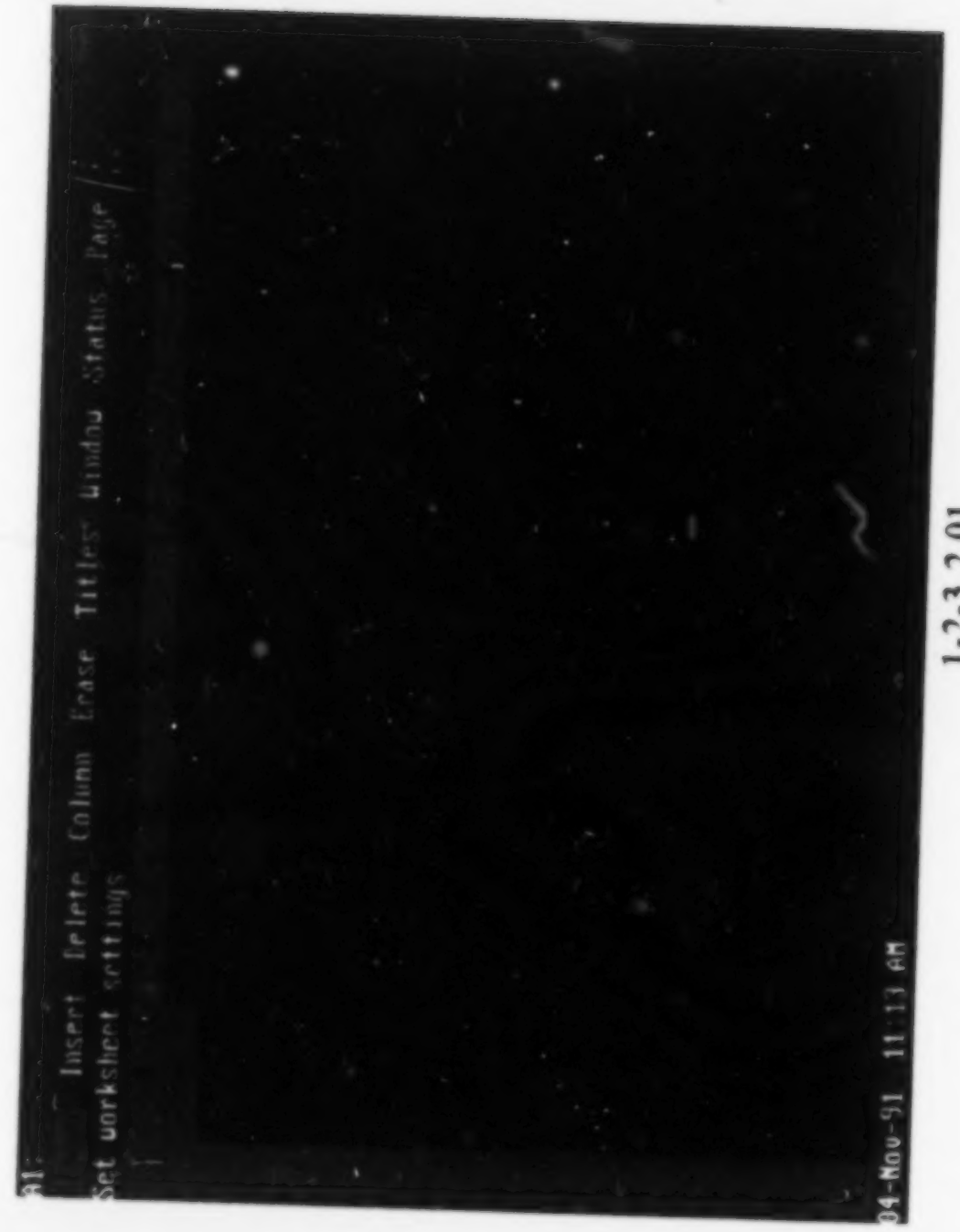


# QUATTRO

Commands that affect the worksheet



J.A. 972

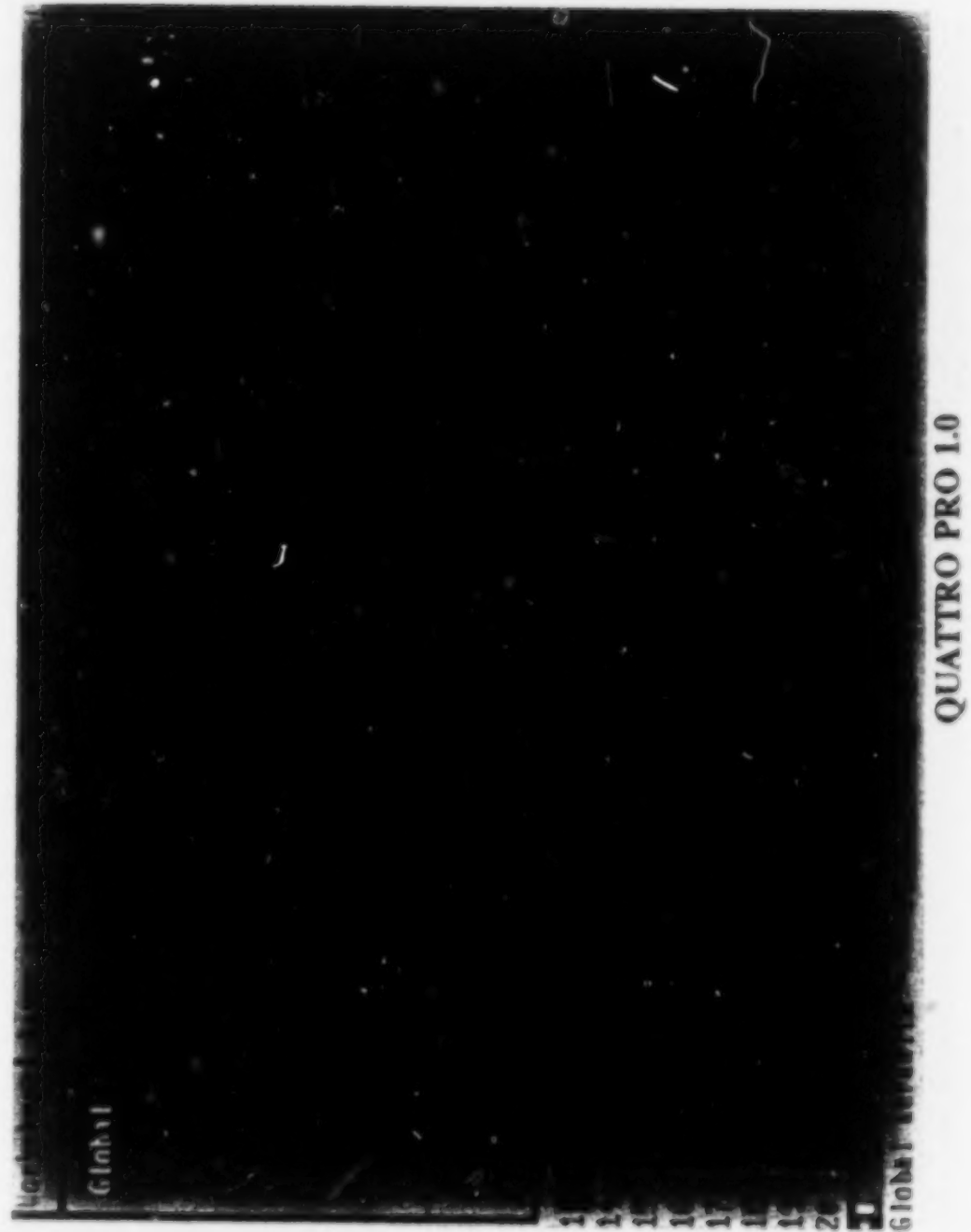


91: Insert Delete Column Erase Titles Window Status Page  
Set worksheet settings

04-Nov-91 11:13 AM

1-2-3 2.01

J.A. 973

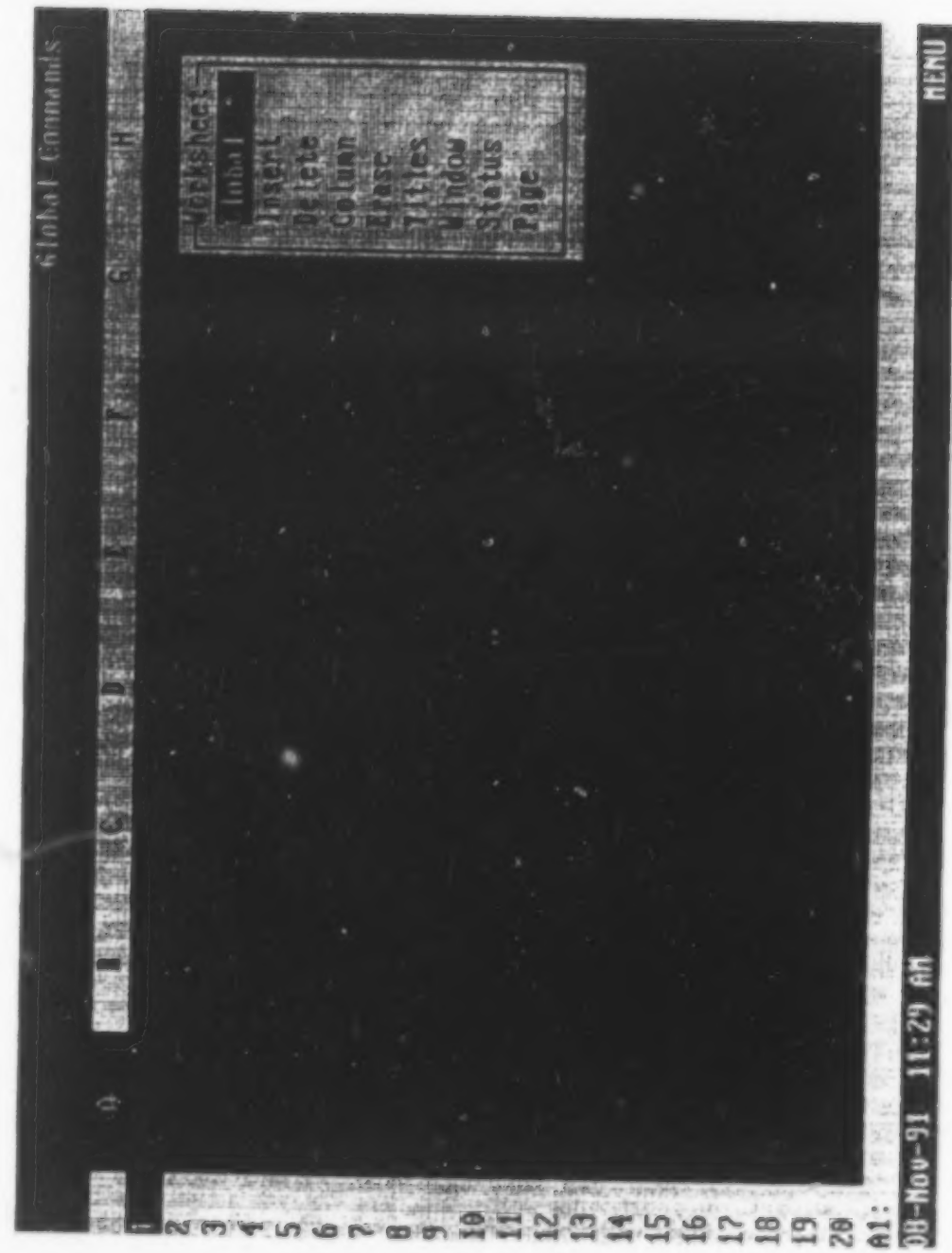


QUATTRO PRO 1.0



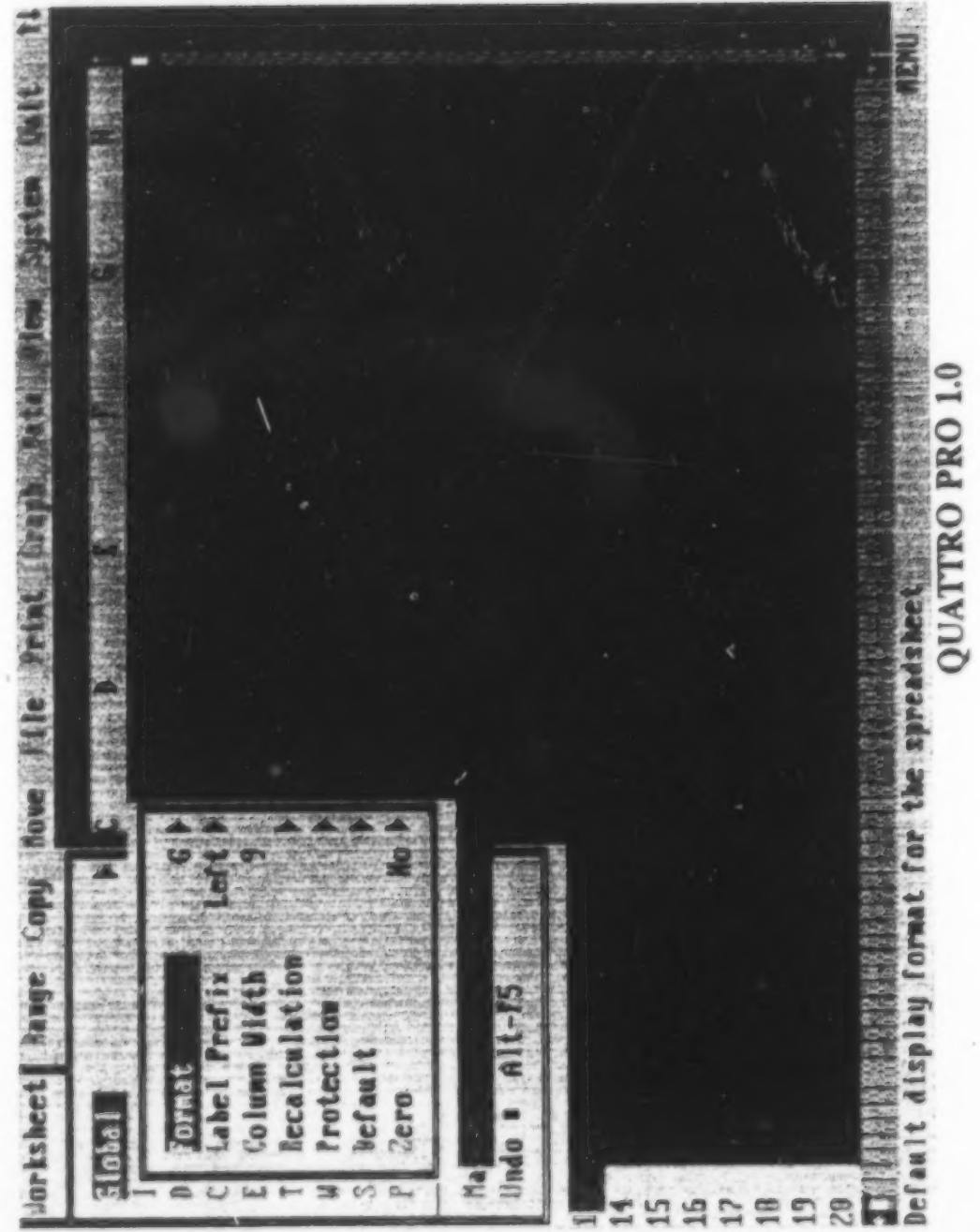
# QUATTRO

J.A. 974





Label-Prefix Column-Width Recalculation Protection Default Zero  
Set global format





QUATTRO

Default display menu

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 A1:

Label Prefix: [redacted] (6)

Column Width: [redacted] (6)

Acceleration: [redacted] (6)

Protection: [redacted] (6)

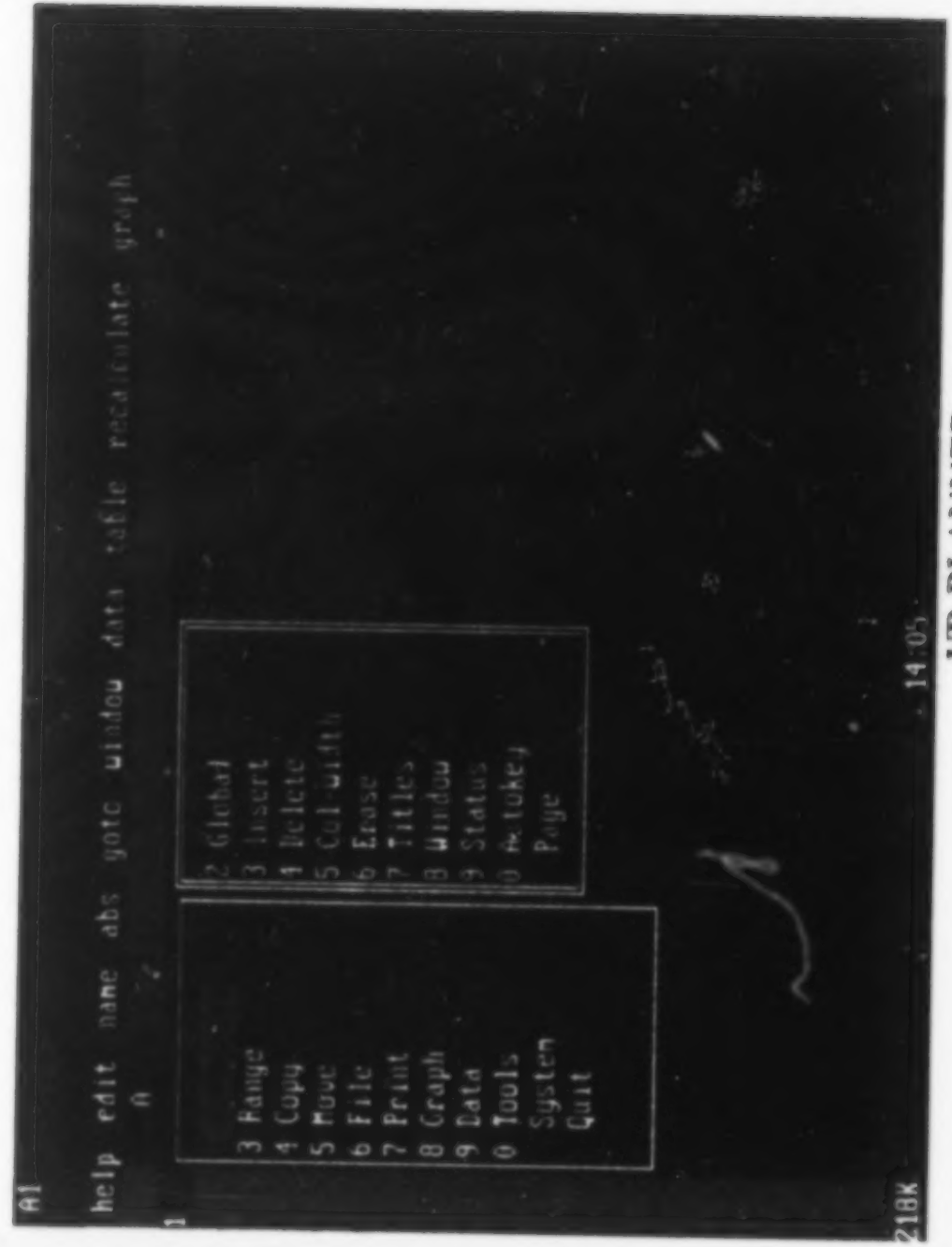
Offset: [redacted] (6)

Zero: [redacted] (6)

28-Oct-91 11:15 PM

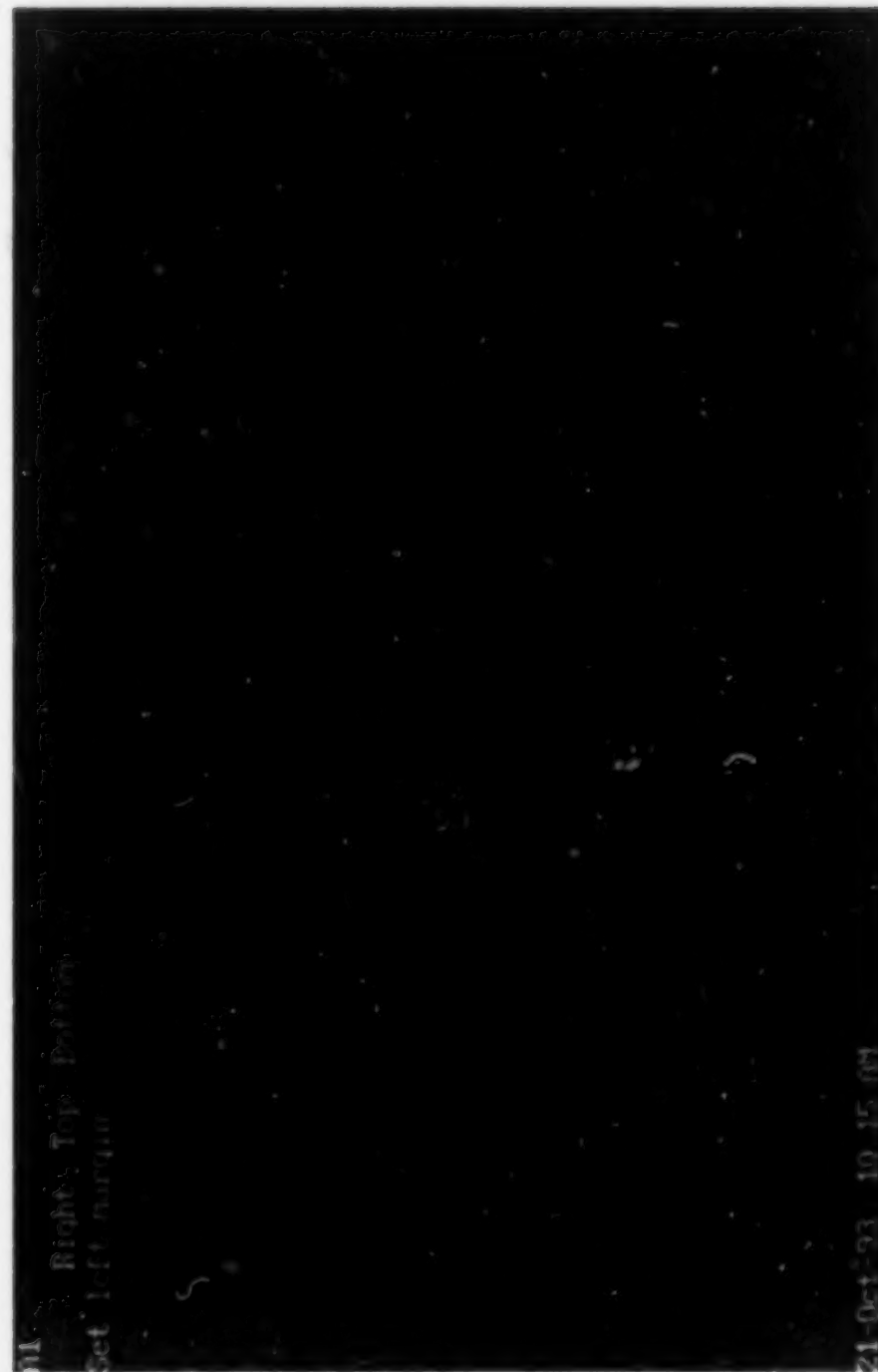
MINI

J.A. 977

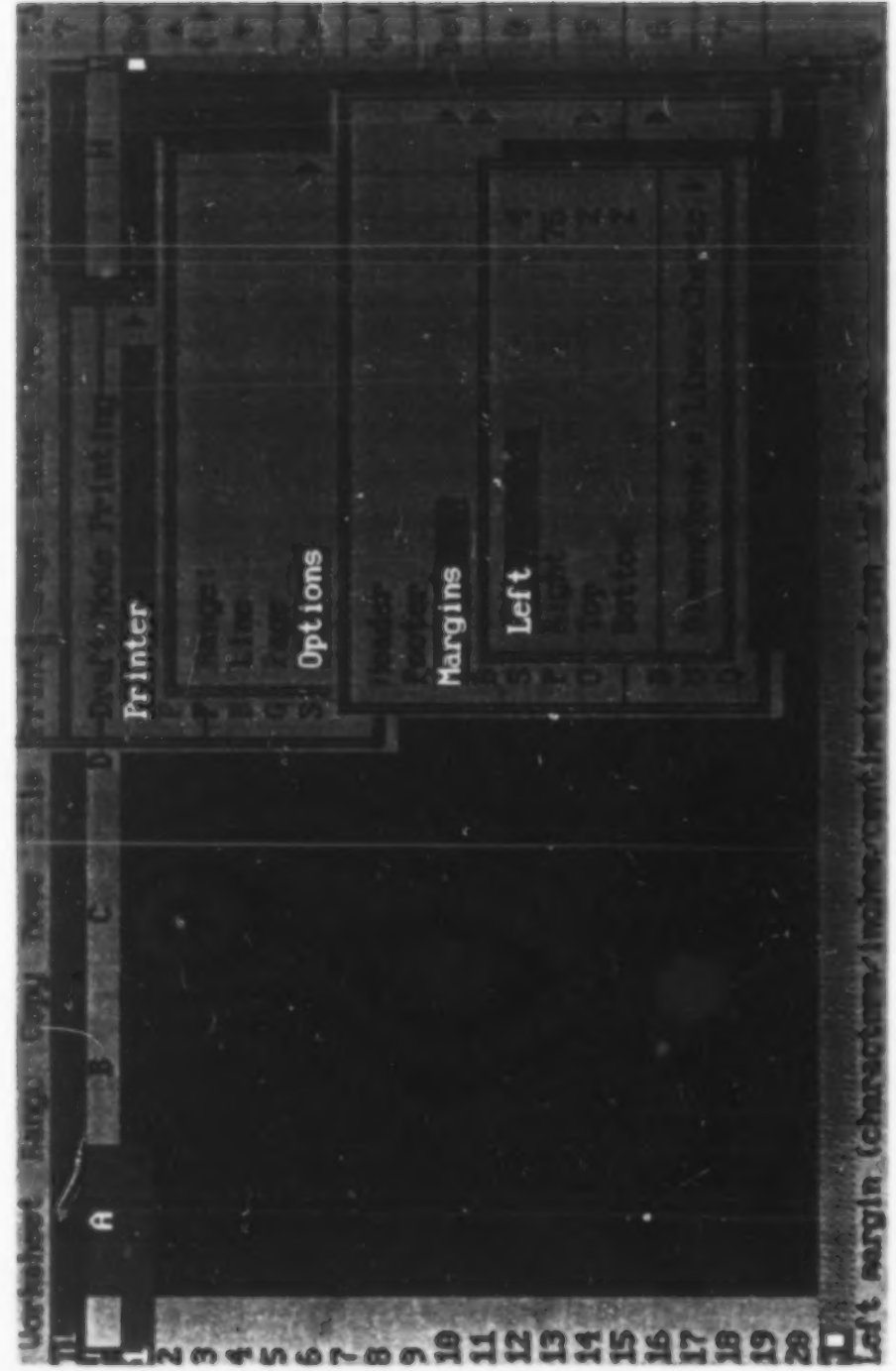


**Exhibits from Briefs of Defendant/Appellant from  
Court of Appeals for the First Circuit**





Lotus 1-2-3 Screen Display When Setting the Left Margin for Printing

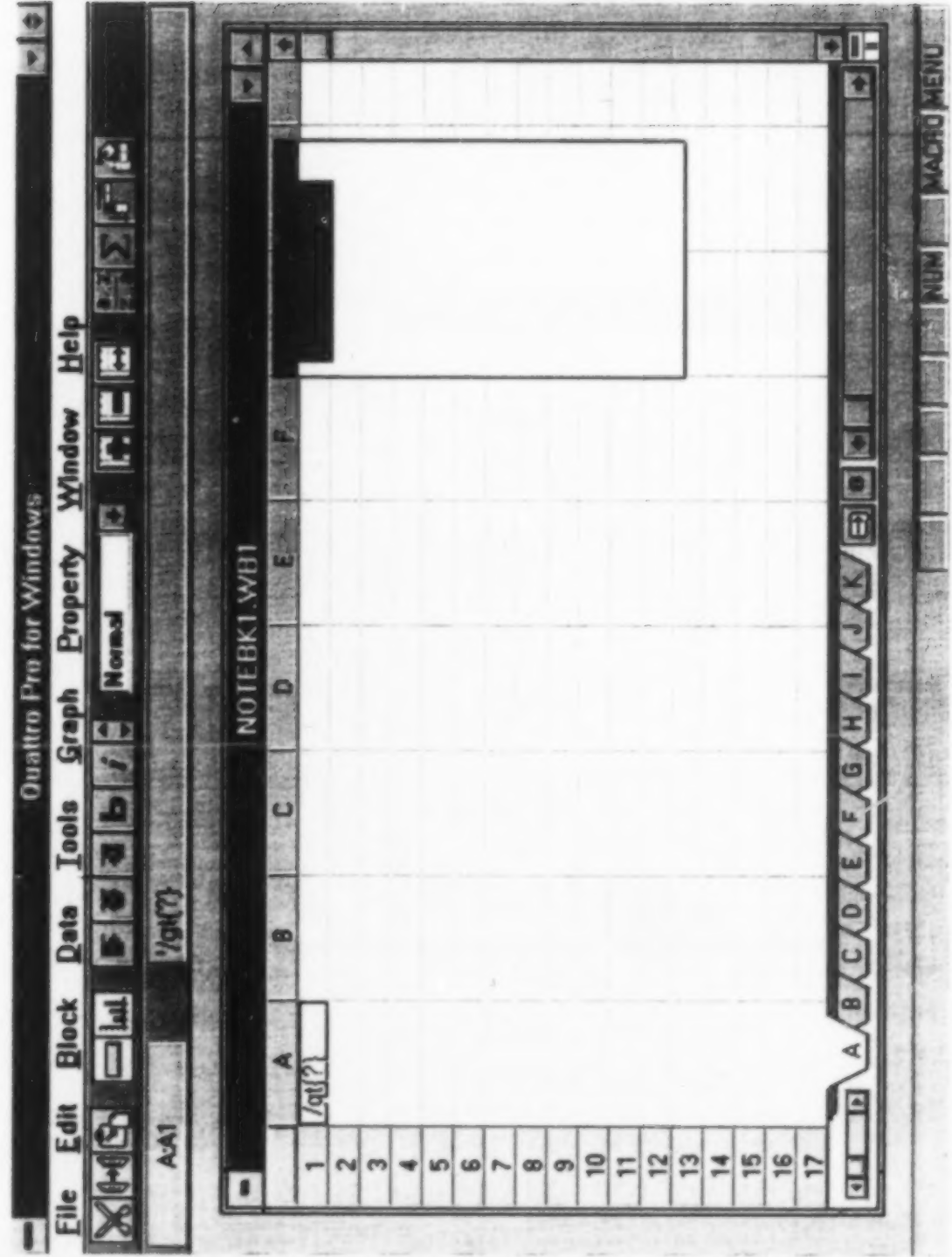


Borland's Quattro Pro Screen Display in "123-Compatible Mode" When Setting the Left Margin for Printing



Lotus 1-2-3 Screen Display, Showing Available Command Choices and Long Prompt Message





A1

Sheet1

	A	B	C	D	E	F	G	H	I
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									

Microsoft Excel Help

Index Print Back Next Help

LOTUS 1-2-3 COMMANDS

Worksheet

Range

Copy

Move

File

Print

Graph

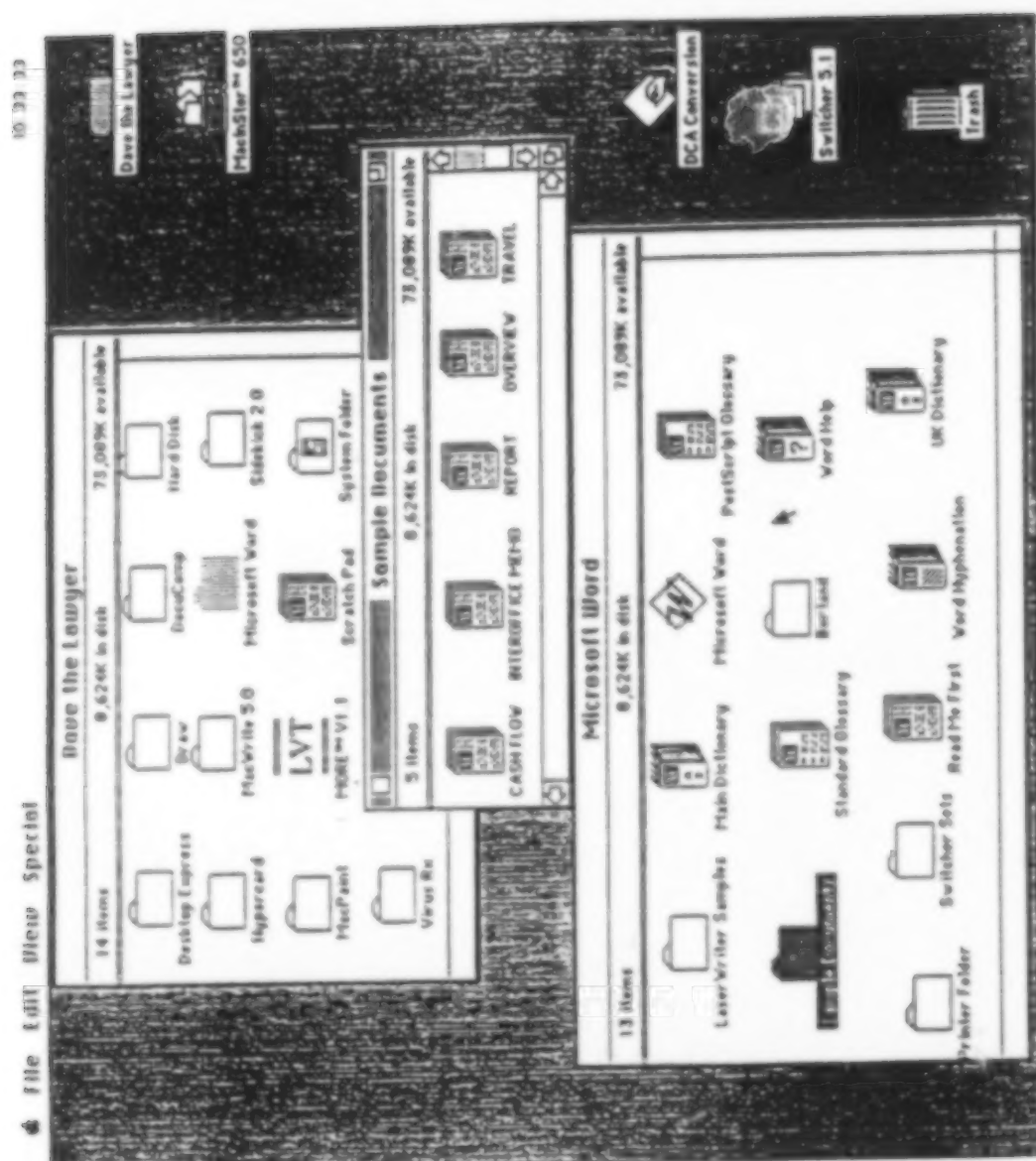
Data

System

Quit

For information on printing charts, see Chart in the Reference.

## Macintosh Screen Display



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